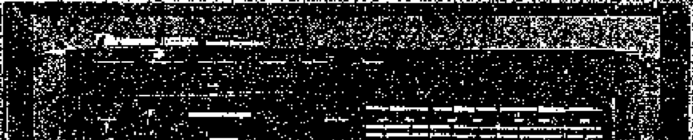
Nakamichi

Service Manual

Nakamichi
1000ZXL

Computing Cassette Deck



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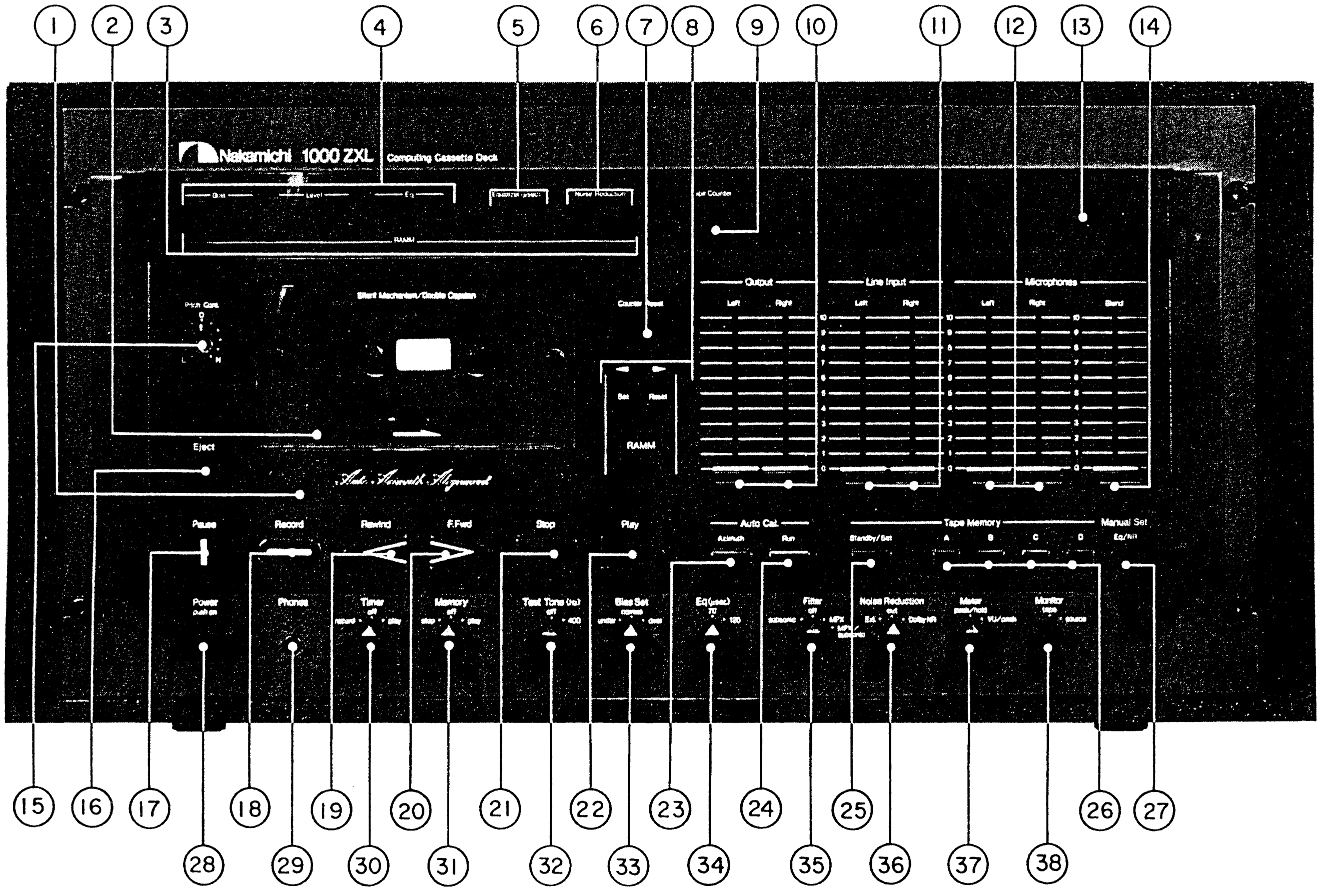
1. GENERAL

1.1. Control Functions

The Nakamichi 1000ZXL control functions are shown below: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Nakamichi 1000 ZXL Computing Cassette Deck
RAMM
Pitch Cont.
Counter Reset
Set
Reset
Output
Left
Right
Line Input
Microphones
Blend
Eject
Pause
Record
Rewind
F.Fwd
Stop
Play
Auto Cal.
Azimuth
Run
Tape Memory
Standby/Set
A
B
C
D
Manual Set
Power
Phones
Timer
Memory
Test Tone
Bias Set
Eq
Filter
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Fig. 1.1 Front View

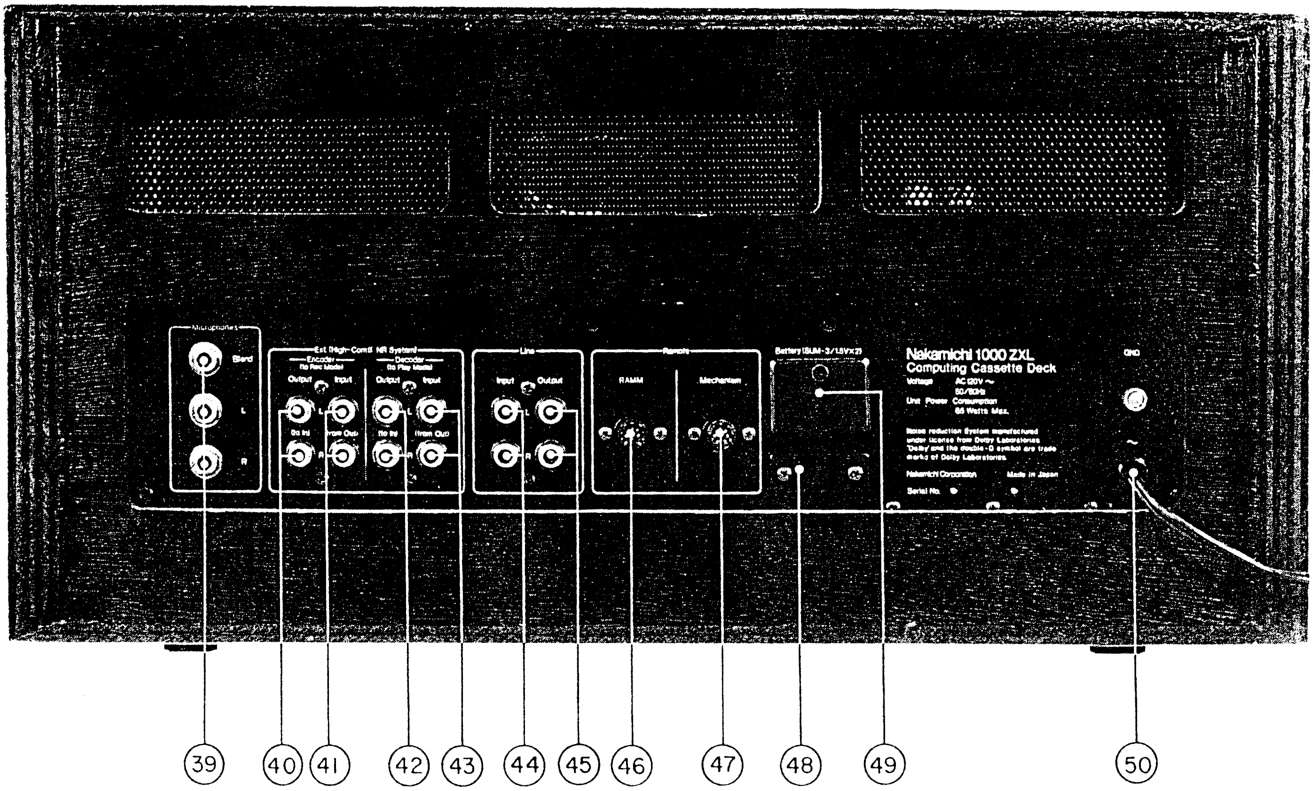

Fig. 1.2 Rear View

1. Adjustment Screw Cover
2. Cassette Holder
3. RAMM Indicator Panel
4. Auto Calibration Indicator Panel
5. Playback Equalization Indicator Panel
6. Noise Reduction Indicator Panel
7. Counter Reset Button
8. RAMM Control Buttons
9. Tape Counter
10. Output Level Controls (L, R)
11. Line Input Level Controls (L, R)
12. MIC Level Controls (L, R)
13. Fluorescent (FL) Level Indicators
14. Blend MIC Level Control
15. Pitch Control
16. Eject Button
17. Pause Button
18. Record Button
19. Rewind Button
20. Fast-Forward Button
21. Stop Button
22. Play Button
23. Auto Azimuth Alignment Button
24. Auto Calibration Button
25. Standby/Set Button
26. Tape Memory Buttons
27. Manual Set Button
28. Power Switch
29. Headphone Jack
30. Timer Switch
31. Memory Switch
32. Test Tone Switch
33. Bias Set Switch
34. Playback Equalization Switch
35. Filter Switch
36. Noise Reduction Switch
37. Meter Switch
38. Monitor Switch
39. Microphone Jacks
40. Encoder Output Jacks
41. Encoder Input Jacks
42. Decoder Output Jacks
43. Decoder Input Jacks
44. Line Input Jacks
45. Line Output Jacks
46. RAMM Remote Control Socket
47. Transport Remote Control Socket
48. Voltage Selector
49. Battery Compartment
50. Power Cord

1.2. Voltage Selector

Voltage selector is installed on the rear panel for Other Version of the Nakamichi 1000ZXL.
This voltage selector can select either 120 V or 220-240 V at customer's disposal.

2. REMOVAL PROCEDURES

2.1. Cabinet Ass'y

Refer to Fig. 2.1.

(1) Remove F01, F02, F03 and F04, then disassemble F05 (Synthesis Mechanism Ass'y) and F06 (Cabinet Ass'y).

2.2. Cassette Case Cover Ass'y and Azimuth Alignment Cover Ass'y

Refer to Fig. 2.2.

(1) Turn fully counterclockwise two screws which are mounted on the Cassette Case Cover, then disassemble F01 (Cassette Case Cover Ass'y).

(2) Turn fully counterclockwise two screws which are mounted on the Azimuth Alignment Cover, then disassemble F02 (Azimuth Alignment Cover Ass'y).

2.3. Front Panel Ass'y

Refer to Fig. 2.2.

(1) Refer to Fig. 2.1. Remove Cabinet Ass'y referring to item 2.1.

(2) Pull out F03 (Pitch Control Knob) and F04 (Function Switch Knob).

(3) Remove F05, F06 and F07, then disassemble F08 (CPU P.C.B. Shield Plate).

(4) Remove F09, then turn F10 (CPU P.C.B. Ass'y) over as an arrow head.

(5) Remove F11 and F12, then turn F13 (Rear Panel Ass'y) as an arrow head.

(6) Disassemble F14 (Front Panel Ass'y including 19 connectors).

2.4. Mechanism Ass'y

Refer to Fig. 2.2.

(1) Remove Front Panel Ass'y referring to item 2.3.

(2) Remove F15 and F16, then disassemble F17 (Mechanism Ass'y including 6 connectors).

2.5. CPU P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.3.

(2) Remove F01 and F02, then disassemble F03 (CPU P.C.B. Shield Plate).

(3) Remove F04 and F05, then disassemble F06 (CPU P.C.B. Ass'y including 6 connectors).

(4) Remove F07 (CPU P.C.B. B Ass'y) by releasing the self-interlocking pin of the P.C.B. Supporters, then disassemble F08 (CPU P.C.B. A Ass'y).

2.6. RAMM P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Remove CPU P.C.B. Ass'y referring to item 2.5.

(2) Remove F09, F10, F11 and F12 then disassemble F13 (RAMM P.C.B. Ass'y including 12 connectors).

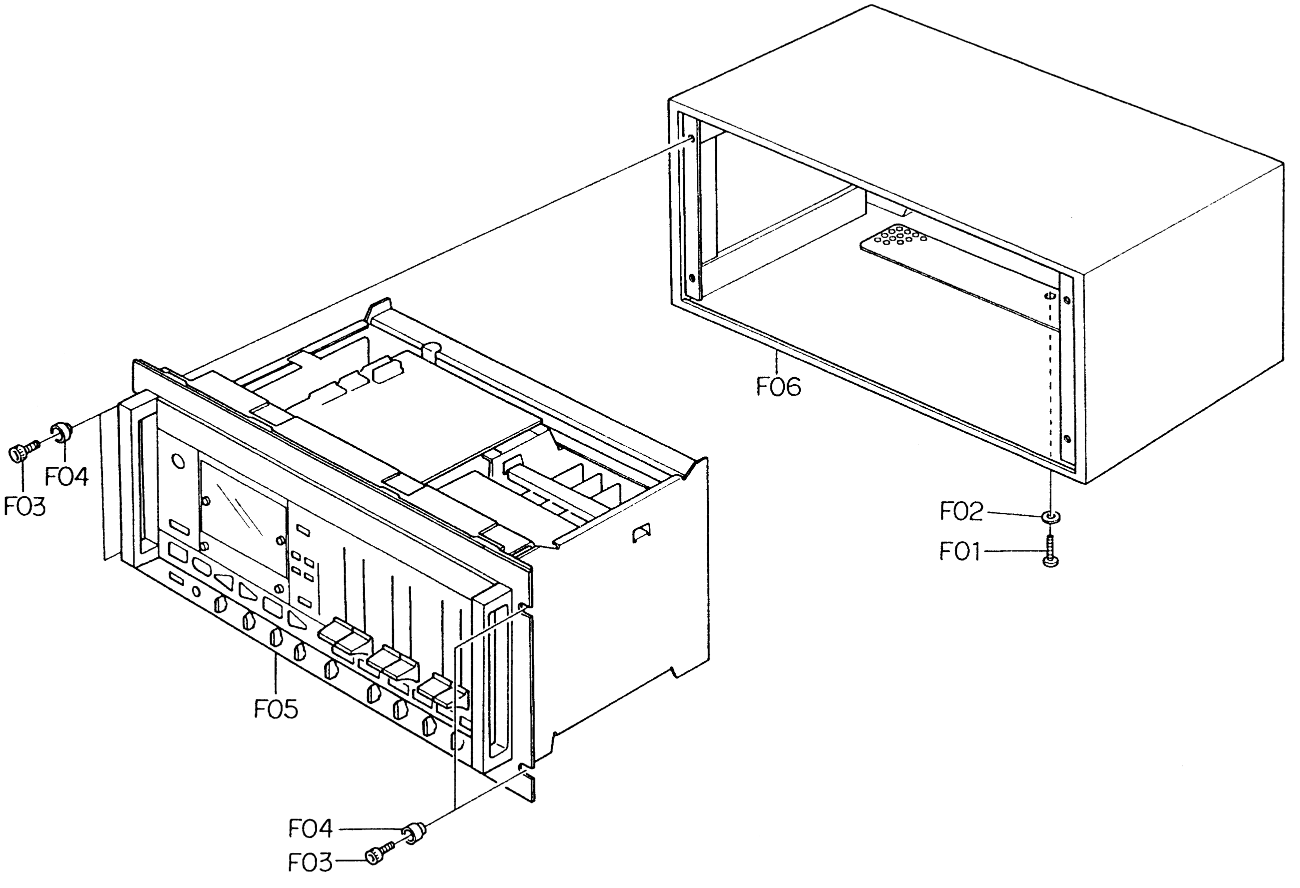

Fig. 2.1

2.7. Record Eq. Amp. Ass'y, Detector P.C.B. Ass'y, Record Dolby NR P.C.B. Ass'y and Playback Amp. & Dolby NR P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.1. Remove Cabinet Ass'y referring to item 2.1.

(2) Remove F14, then disassemble F15 (P.C.B. Holder Ass'y.

(3) Pull out F16 (Record Eq. Amp. P.C.B. Ass'y), F17 (Detector P.C.B. Ass'y), F18 (Record Dolby NR P.C.B. Ass'y) and F19 (Playback Amp. & Dolby NR P.C.B. Ass'y).

2.8. Power Switch

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.3.

(2) Remove F20, then disassemble F21 (Power Switch).

2.9. Logic P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.3.

(2) Remove F22, F23 and F24, then disassemble F25 (Logic P.C.B. Ass'y including 6 connectors and wires connected by soldering).

2.10. Main P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Remove Front Panel Ass'y referring to item 2.3.

(2) Remove F16, F27 and F28 and F29, then disassemble F30 (Main P.C.B. Shield Plate).

(3) Remove F31, then disassemble F32 (Main P.C.B. Ass'y including 2 connectors and wires connected by wrapping).

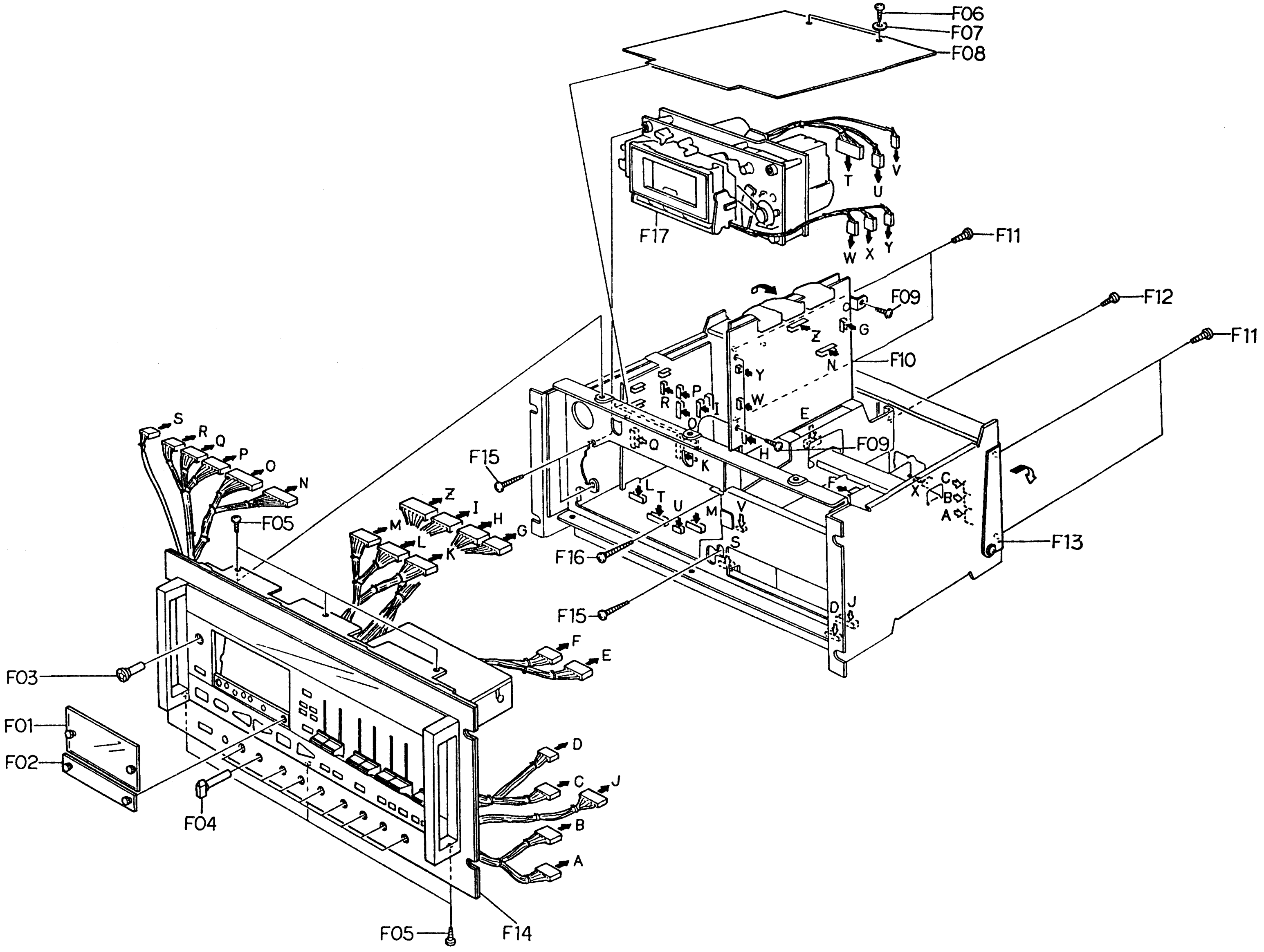
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Fig. 2.2

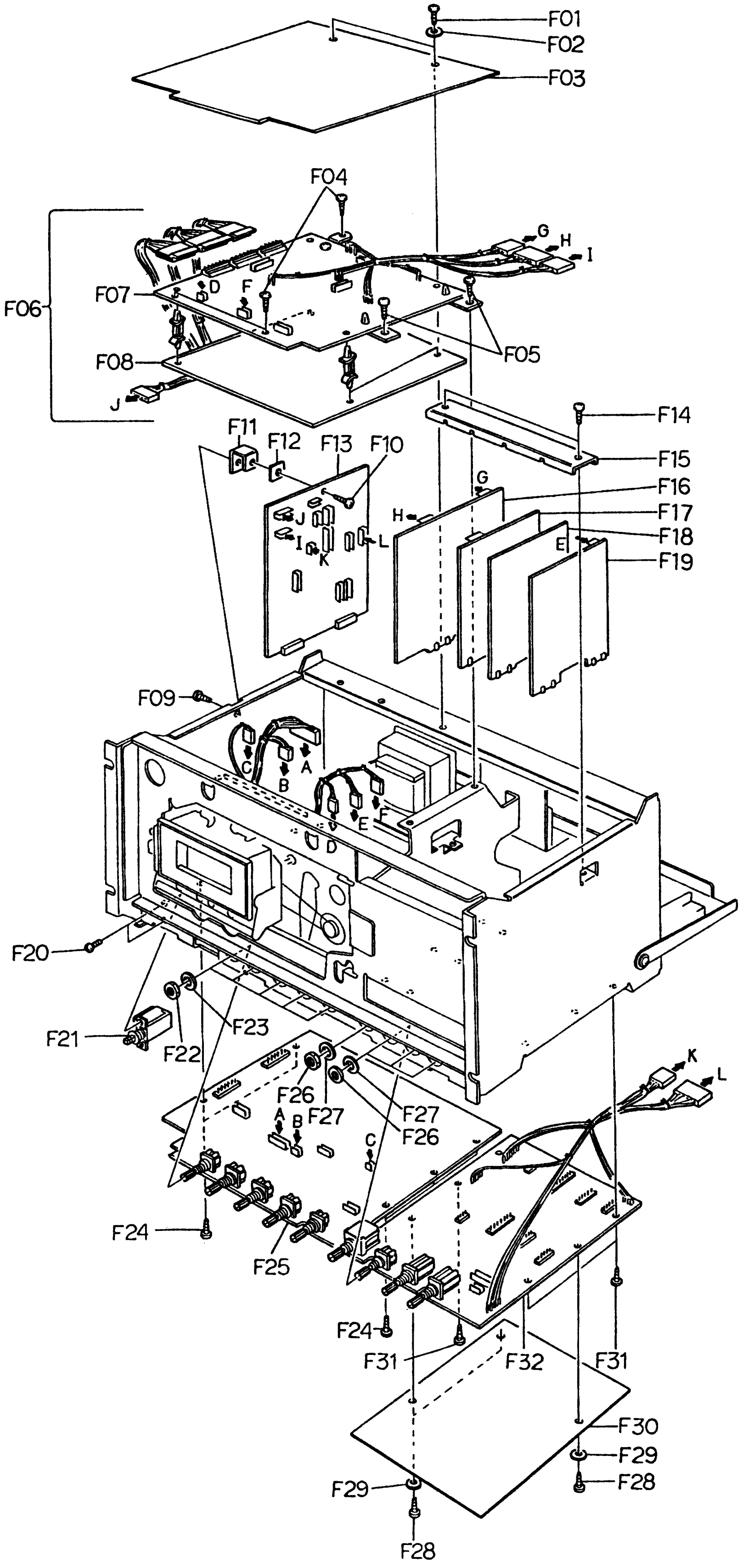
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Fig. 2.3

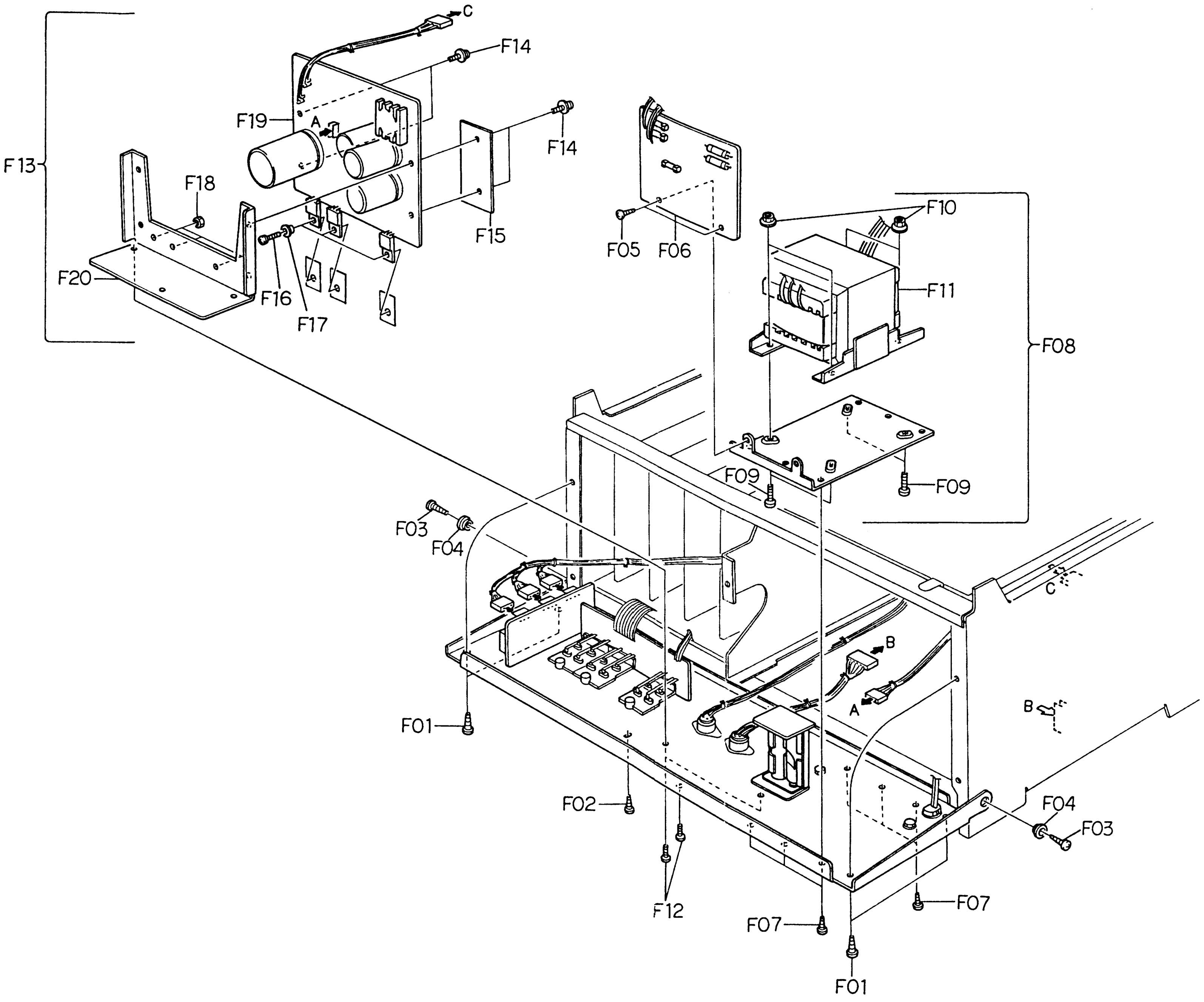

Fig. 2.4

2.11. Rear Panel Ass'y

Refer to Fig. 2.4.

(1) Refer to Fig. 2.1. Remove Cabinet Ass'y referring to item 2.1.

(2) Remove F01, F02, F03 and F04, then disassemble Rear Panel Ass'y (including 6 connectors and wires connected by wrapping).

2.12. Fuse P.C.B. Ass'y and Power Transformer

Refer to Fig. 2.4.

(1) Remove Rear Panel Ass'y referring to item 2.11.

(2) Remove F05, then disassemble F06 (Fuse P.C.B. Ass'y).

(3) Remove F07, then disassemble F08 (Power Transformer Ass'y).

(4) Remove F09 and F10, then disassemble F11 (Power Transformer).

2.13. Power Supply P.C.B. Ass'y

Refer to Fig. 2.4.

(1) Remove Rear Panel Ass'y referring to item 2.11.

(2) Remove F12, then disassemble F13 (Power Supply Ass'y including two connectors and wires connected by solding on F19 Power Supply P.C.B. Ass'y).

(3) Remove F14, then disassemble F15 (Insulator).

(4) Remove F16, F17 and F18, then disassemble F19 (Power Supply P.C.B. Ass'y) and F20 (Heat Sink).

2.14. FL Indicator Ass'y, Volume Holder & Front Escutcheon B Ass'y, Display House Ass'y, Front Escutcheon A Ass'y, Headphone Jack Holder Ass'y and Front Panel Sub Ass'y

Refer to Fig. 2.5.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.3.

(2) Remove F01, then disassemble F02 (FL Indicator Ass'y).

(3) Remove F03 (Slide Volume Knob), F04, F05 and F06, then disassemble F07 (Volume Holder & Front Escutcheon B Ass'y).

(4) Remove F08, then disassemble F09 (MIC Amp. & Volume P.C.B. Ass'y).

(5) Remove F10, then disassemble F11 (Function P.C.B. Ass'y) and F12 (Front Escutcheon B Ass'y).

(6) Remove F13, then disassemble F14 (Display House Ass'y).

(7) Remove F15, then disassemble F16 (Display P.C.B. Ass'y) and F17 (Display House).

(8) Remove F18, F19, F20 and F21, then disassemble F22 (Front Escutcheon A Ass'y).

(9) Remove F23, then disassemble F24 (Mechanism Control Switch P.C.B. Ass'y).

10) Remove F25, then disassemble F26 (RAMM Control Switch P.C.B. Ass'y) and F27 (Front Escutcheon Sub A Ass'y).

2.15. FL Indicator P.C.B. Ass'y

Refer to Fig. 2.6.

(1) Refer to Fig. 2.5. Remove FL Indicator Ass'y referring to item 2.14.

(2) Remove F01, then disassemble F02 (FL Indicator Case Cover).

(3) Remove F03 (FL Indicator Holder L) and F04 (FL Indicator R), then disconnect 3 connectors.
Disassemble F05 (FL Indicator P.C.B. A Ass'y) and F06 (FL Indicator P.C.B. B Ass'y).

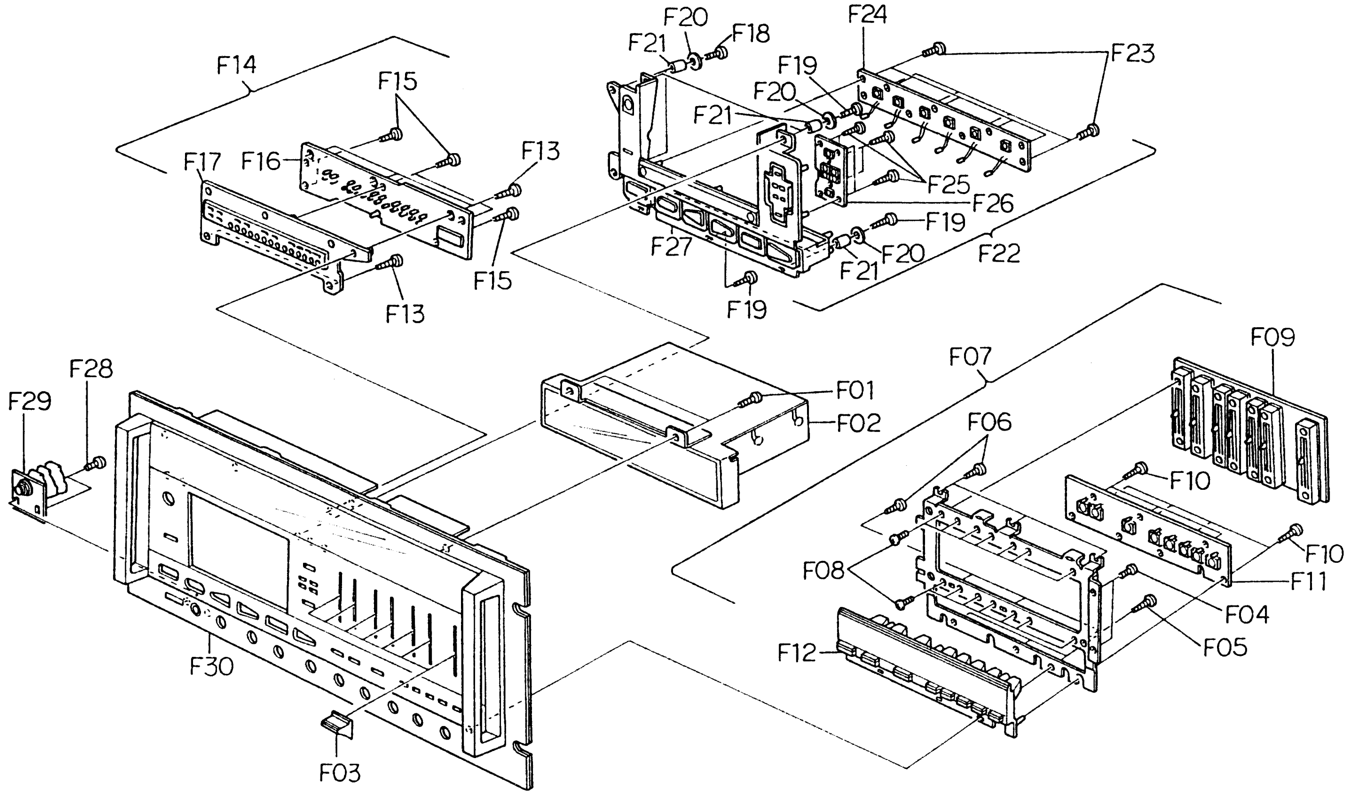
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Fig. 2.5

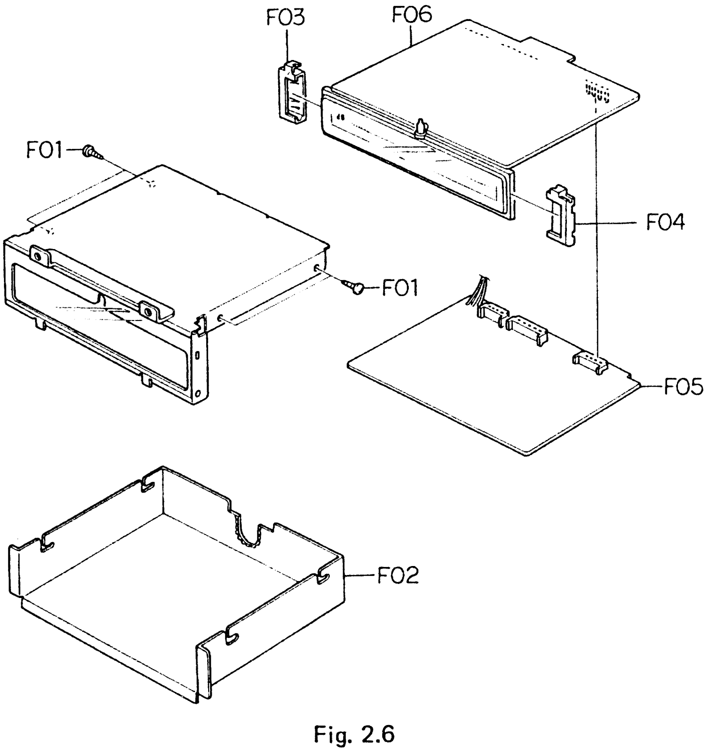
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Fig. 2.6

2.16. Cassette Case Ass'y and Cover Plate Ass'y

Refer to Fig. 2.7.

(1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.4.

(2) Press the Eject Button to open the Cassette Case Ass'y.

(3) Remove F01 and F02, then disassemble F03 (Cassette Case Holder L Ass'y) by releasing the Self-interlocking Pin of the Damper Lock Arm and F04 (Cassette Case Ass'y).

(4) Remove F05, then disassemble F06 (Cover Plate Ass'y).

2.17. Capstan Motor Ass'y and Flywheel Ass'y

Refer to Fig. 2.8.

(1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.4.

(2) Remove F01 and F02, then disassemble F03 (Flywheel Holder Ass'y) and F08 (Capstan Belt).

(3) Remove F04, then disassemble F05 (Capstan Motor Ass'y).

(4) Remove F06, then disassemble F07 (Speed Cal. P.C.B. Ass'y).

(5) Remove F09 (Supply Flywheel Ass'y), then disassemble F10 (Take-up Flywheel Ass'y).

(6) After removing both Flywheel Assemblies, disassemble F11 (Thrust Washer 3 mm), F12 (Thrust Washer 2.6 mm), F13 (Flange Thrust Cap) and F14 (Thrust Spring).

2.18. Sub Mechanism Chassis Ass'y

Refer to Fig. 2.9.

(1) Remove Flywheel Holder Ass'y referring to item 2.17.

(2) Remove F01 and F02, then disassemble F03 (Sub Mechanism Chassis Ass'y).

2.19. Control Motor Ass'y and Reel Motor Ass'y

Refer to Fig. 2.9.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.

(2) Remove F04, then disassemble F05 (Control Motor Ass'y).

(3) Remove F06, then disassemble F07 (Reel Motor Ass'y).

2.20. Cam Control Volume

Refer to Fig. 2.9.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.

(2) Remove F08, then disassemble F09 (Volume Coupler).

(3) Remove F10, then disassemble F11 (Cam Control Volume).

2.21. Azimuth Motor Ass'y

Refer to Fig. 2.9.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.

(2) Remove F12, then disassemble F13 (Azimuth Alignment Motor Ass'y).

(3) Remove F14, then disassemble F15 (Azimuth Motor Ass'y) and F16 (Drive Pulley Ass'y).

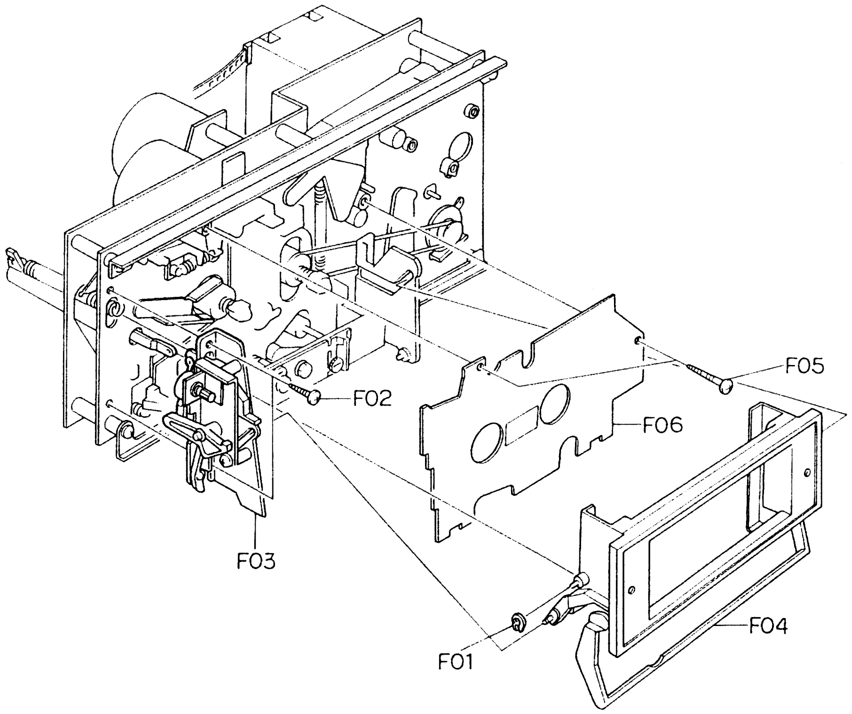


Fig. 2.7

2.22. Reel Hub Ass'y and Idler Ass'y

Refer to Fig. 2.9.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.

(2) Remove F17 (Reel Hub Head), then disassemble F18 (Reel Hub B Ass'y), F19 (Reel Hub Take-up Ass'y), F20 (Reel Hub Supply Ass'y), F21 (Back Tension Ass'y) and F22 (Back Tension Spring).

(3) Remove F23, then disassemble F24 (Idler Ass'y).

2.23. Cam Drive Gear and Control Cam

Refer to Fig. 2.9.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.

(2) Remove F25, then disassemble F26 (Cam Drive Gear).

(3) Remove F27, then disassemble F28 (Counter-Load Arm Ass'y).

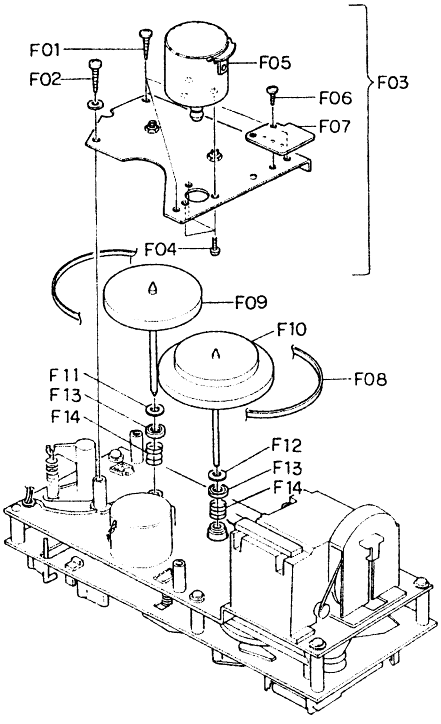
(4) Remove F29, then disassemble F30 (Control Cam).

2.24. Counter Pulse Generator P.C.B. Ass'y

Refer to Fig. 2.9.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.18.

(2) Remove F31, then disassemble F32 (Counter Pulse Generator P.C.B. Ass'y).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F14

Fig. 2.8

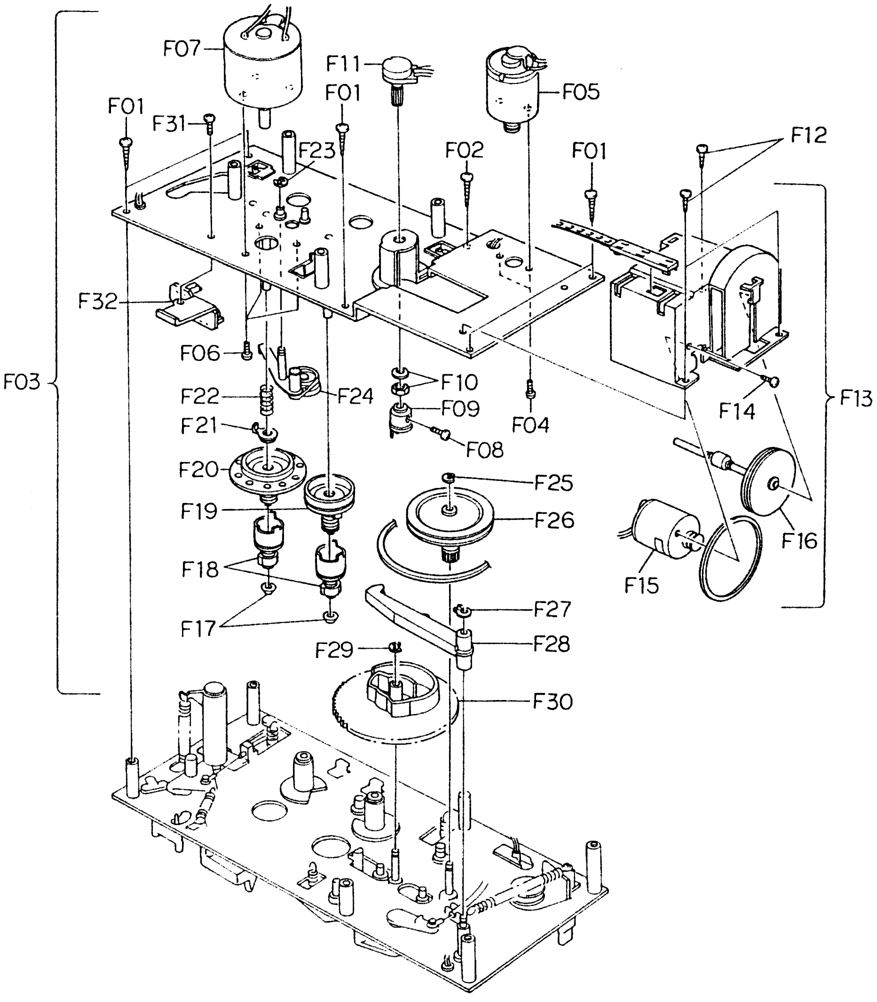

F07
F11
F01
F05
F01
F31
F23
F02
F01
F12
F32
F06
F22
F24
F10
F09
F04
F21
F08
F03
F14
F13
F20
F25
F19
F26
F16
F18
F15
F27
F17
F28
F29
F30

Fig. 2.9

2.25. Head Mount Base Ass'y

Refer to Fig. 2.10.

(1) Refer to Fig. 2.7. Remove Cassette Case Ass'y referring to item 2.16.

(2) Remove F01, then disassemble F02 (Head Mount Base Ass'y).

2.26. Pressure Roller Ass'y and Erase Head

Refer to Fig. 2.10.

(1) Remove Head Mount Base Ass'y referring to item 2.24.

(2) Remove F03, then disassemble F04 (Supply Pressure Roller Ass'y).

(3) Remove F05, then disassemble F06 (Erase Head).

(4) Remove F07, then disassemble F08 (Take-up Pressure Roller Ass'y).

2.27. Playback Head Ass'y and Record Head Ass'y

Refer to Fig. 2.10.

(1) Remove Head Mount Base Ass'y referring to item 2.24.

(2) Turn F09 by 90° by pushing it, then disassemble F10 (Playback Head Ass'y).

(3) Turn F11 by 90° by pushing it, then disassemble F12 (Record Head Ass'y) and F13 (RH Azimuth Alignment Plate).

2.28. Battery

Refer to Fig. 2.11.

(1) Turn fully counterclockwise the screw which is mounted on the Rear Panel Ass'y, then pull out Battery Case Ass'y.

(2) Pull up the Ribbon in Battery Case. Then take out Batteries from Battery Case.

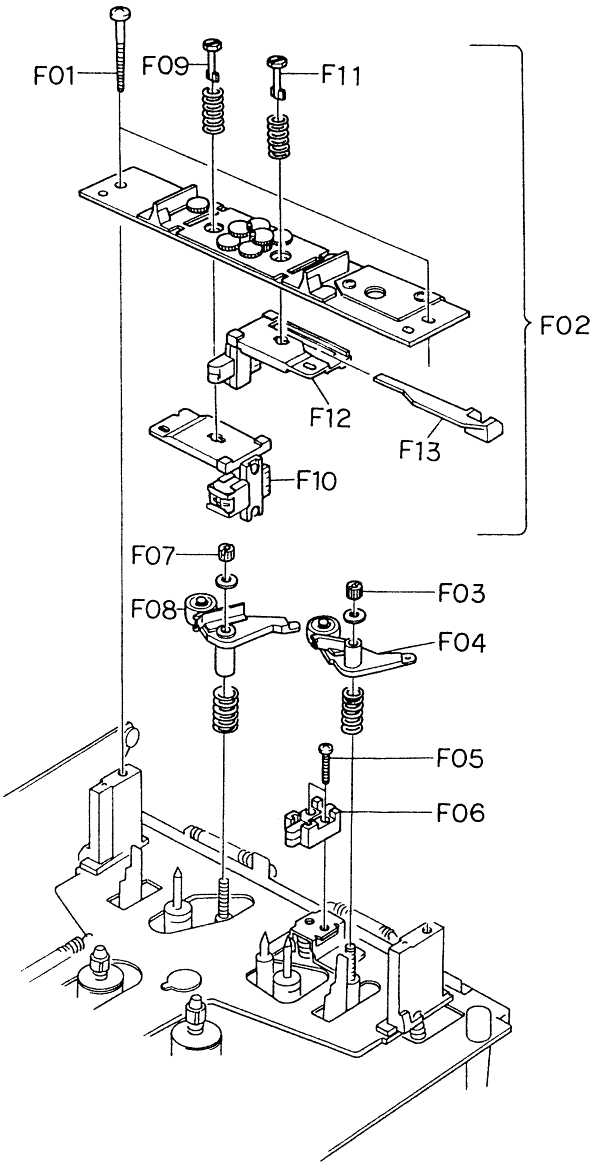


Fig. 2.10

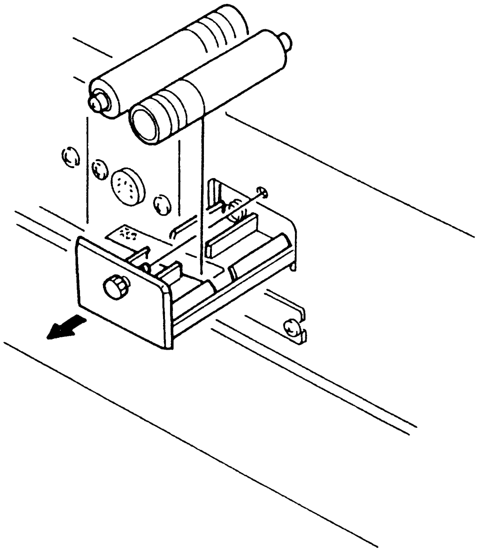


Fig. 2.11

3. MEASUREMENT AND MAINTENANCE INSTRUMENTS

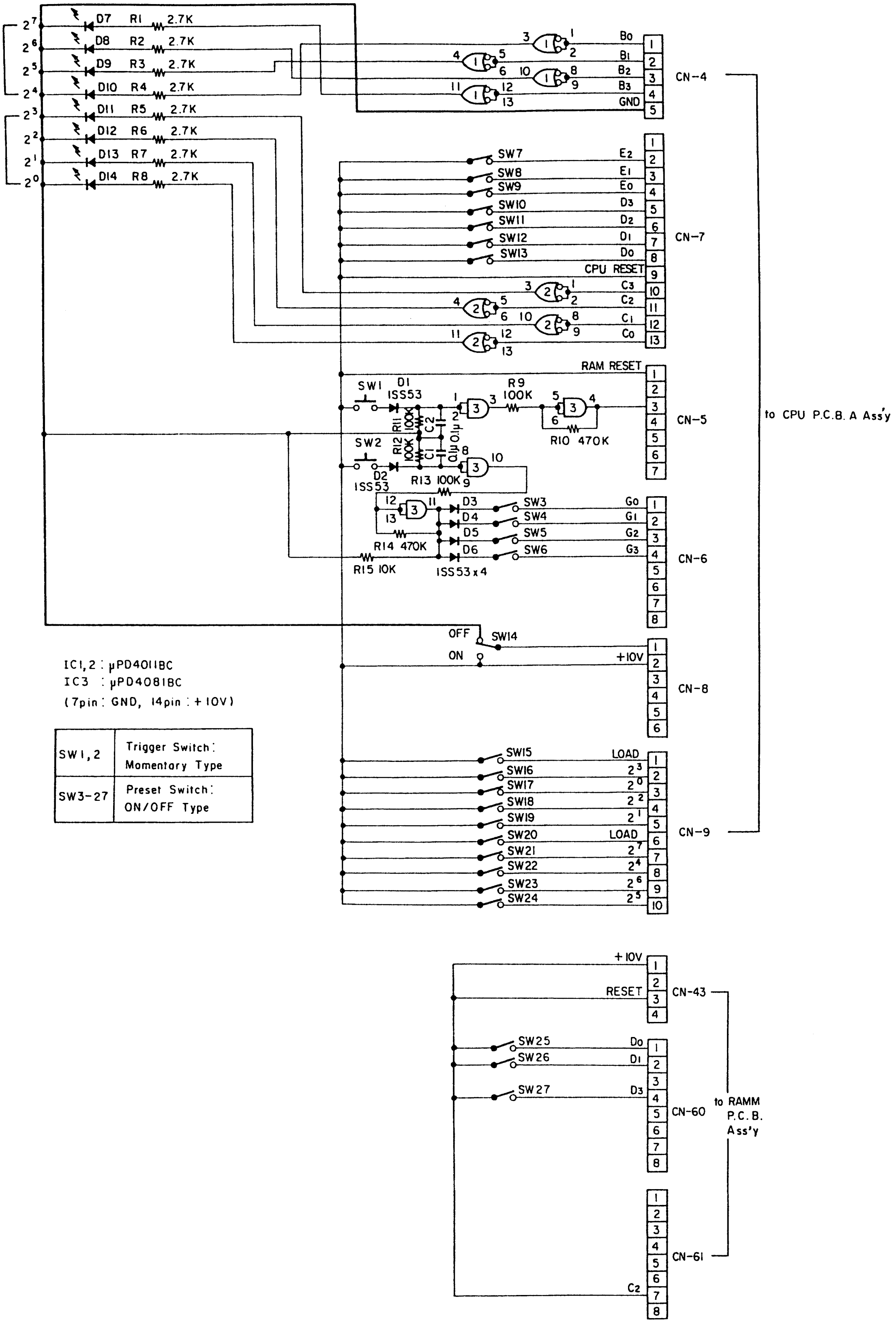
3.1. Measurement Instruments

(1) Audio Generator (20 Hz – 200 kHz)
(2) AC Millivolt Meter (with dB measures)
(3) Oscilloscope (DC – 5 MHz)
(4) Distortion Meter
(5) Speed & Wow/Flutter Meter
(6) Frequency Counter (DC –10 MHz)
(7) Ohm Meter
(8) DC Volt Meter
(9) AC Volt Meter
(10) Torque Gauge (DA09013A)
(11) 15 kHz Azimuth Tape (DA09004A)
(12) 3 kHz Speed & Wow/Flutter Tape (DA09006A)
(13) 1 kHz Track Alignment Tape (DA09007A)
(14) 400 Hz Level Tape (DA09005A)
(15) 20 kHz PB Frequency Response Tape (DA09001A)
(16) 15 kHz PB Frequency Response Tape (DA09002A)
(17) 10 kHz PB Frequency Response Tape (DA09003A)
(18) Reference EXII Tape (DA09021A)
(19) Reference SX Tape (DA09025A)
(20) Reference ZX Tape (DA09037A)
(21) Tilt Check Gauge M-9039 (DA09039A)
(22) EH Tilt Check Gauge M-9040 (DA09040A)
(23) EH Stroke Check Gauge M-9051 (DA09051A)
(24) Stroke Check Gauge M-9047 (DA09047B)
(25) Record Head Mounting Gauge M-9048 (DA09048A)
(26) Back Tension Gauge (DA09055A)
(27) Tension Arm Adjustment Cassette (DA09056A)
(28) 5 Hz RAMM Speed Check Tape (DA09061A)
(29) Test Unit M-9057 (DA09057A)
(30) Extension Card M-9058 (DA09058A)
(31) Audio Analyzer T–100
(including Distortion, Wow/Flutter, Speed, Oscillator and dB meter)

Note: (10) – (31) are the products of Nakamichi Corporation.

3.2. Maintenance Instruments

(1) Test Unit


2⁷
2⁶
2⁵
2⁴
2³
2²
2¹
2⁰
D7 R1 2.7K
D8 R2 2.7K
D9 R3 2.7K
D10 R4 2.7K
D11 R5 2.7K
D12 R6 2.7K
D13 R7 2.7K
D14 R8 2.7K
B0
B1
B2
B3
GND
CN-4
SW7 E2
SW8 E1
SW9 E0
SW10 D3
SW11 D2
SW12 D1
SW13 D0
CPU RESET
C3
C2
C1
C0
CN-7
RAM RESET
SW1
D1 1SS53
R9 100K
R10 470K
R11 100K
R12 100K
C1
C2
0.1μ
SW2
D2 1SS53
R13 100K
CN-5
D3 SW3 G0
D4 SW4 G1
D5 SW5 G2
D6 SW6 G3
R14 470K
R15 10K
1SS53 x 4
CN-6
OFF
ON
SW14
+10V
CN-8
SW15 LOAD
SW16 2³
SW17 2⁰
SW18 2²
SW19 2¹
SW20 LOAD
SW21 2⁷
SW22 2⁴
SW23 2⁶
SW24 2⁵
CN-9
to CPU P.C.B. A Ass'y
+10V
RESET
CN-43
SW25 D0
SW26 D1
SW27 D3
CN-60
C2
CN-61
to RAMM P.C.B. Ass'y

IC1,2 : μPD4011BC
IC3 : μPD4081BC
(7pin : GND, 14pin : +10V)

SW1,2	Trigger Switch: Momentary Type
SW3-27	Preset Switch: ON/OFF Type

Fig. 3

4. MECHANICAL ADJUSTMENT

4.1. Mechanism Control Cam Adjustment

Before adjustment, disassemble the Front Panel Ass'y, then remove the Cover Plate Ass'y referring to items 2.3 and 2.16.

(1) Offset Adjustment of Control Motor Driver

(a) Refer to Figs. 4.1 and 4.2.
Adjust VR505 and VR506 on the Logic P.C.B. Ass'y to locate approximately at the middle of the variable range. Then press the Power switch.
VR506 (for Cam position stop)
VR505 (for Cam position play)

(b) Press the Stop button to set the N-1000ZXL in Stop mode.
Adjust VR506 (for stop) so that the "S" mark on the Cam corresponds to the pointer on the mechanism chassis.

(c) Press the Play button to set the N-1000ZXL in Playback mode.
(Cam will rotate, and the position marked with "PY" comes to the pointer.) Adjust VR505 (for play) so that the "PY" mark on the Cam corresponds to the pointer.

(d) Repeat above (b) and (c) 2 – 3 times so that the "S" and "PY" marks on the Cam correspond to the pointer accurately in Stop and Playback modes respectively.
(This adjustment is required because the position adjusted by one volume will be slightly changed when the other volume is adjusted.)

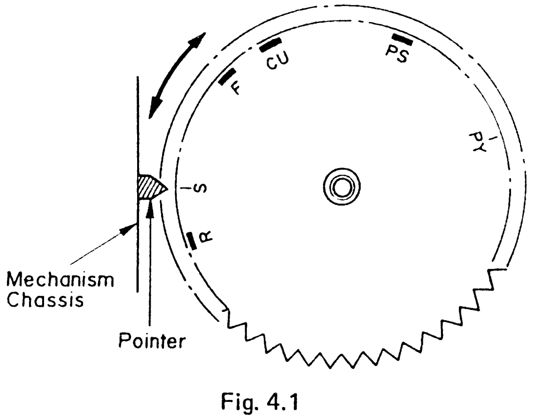


Fig. 4.1

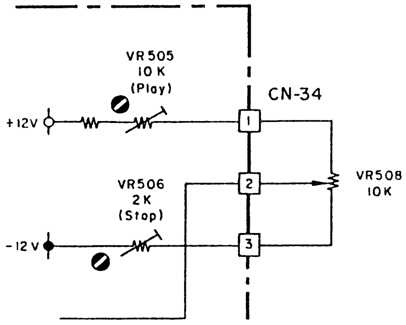


Fig. 4.2

(e) Set the N-1000ZXL in F.F., Pause, or Cue mode by pressing each button (press F.F. and Pause buttons to set the N-1000ZXL in Cue mode) and check to insure that the pointer is in a range of "F", "PS", or "CU" mark respectively.

(f) If out of the range, precise adjustment for each position according to "(2) Offset Fine Adjustment of Control Motor Driver" will be required.

(2) Offset Fine Adjustment of Control Motor Driver

Adjust only if a satisfactory result is not obtained in "(1) Offset Adjustment of Control Motor Driver". This adjustment is made by changing the value of the fixed resistors on the Logic P.C.B. Ass'y.

Note: The value of voltage is typical value.

(a) Observation Point of Reference Voltage

Observe the each voltage at the sliding contact of the Cam Control Volume VR508 (10 kΩ) in Stop, Fast (F.F. or Rewind), Pause and Playback modes.

(b) Reference Voltage

Reference voltage at the sliding contact of VR508 (Cam Control Volume) in each mode is as follows:

Mode	Reference Voltage (Typical Value)	
Stop	–0.4 V	1.7 V ±0.25 V
Fast (F.F./Rew.)	–2.1 V	
Pause	–6.2 V	2.6 V ±0.4 V
Play	–8.8 V	

(c) Resistors for Adjustment

Mode	Ref. No.	Typical Value
Stop	R518	316 kΩ (F)
Fast (F.F./Rew.)	R519	33 kΩ
Pause	R522	51.1 kΩ (F)
Play	R520	71.5 kΩ (F)

(d) Adjustment Procedures

1) Press the Stop button to set the N-1000ZXL in Stop mode.
Adjust the value of R518 to obtain –0.4 V (±0.6 V) at the sliding contact of VR508.
Note: When R518 is adjusted, the reference voltage in Fast (F.F. or Rewind) mode is changed. Therefore, re-check of the reference voltage in Fast mode is required. If the reference voltage is out of the range, re-adjustment of R519 according to next step 2) is necessary.

2) Set the N-1000ZXL in F.F. mode, then adjust the value of R519 so that the voltage of VR508 will become lower by 1.7 V (±0.25 V) than in Stop mode.

3) Press the Pause button to set the N-1000ZXL in Pause mode.
Adjust the value of R522 to obtain –6.2 V (+0.4, –0.15 V) at the sliding contact of VR508.

4) Set the N-1000ZXL in Playback mode, then adjust the value of R520 so that the voltage of VR508 will become lower by 2.6 V (±0.4 V) than in Pause mode.

(3) Cam Timing Adjustment

(a) Remove the wires from the Control Motor terminals to set the motor open.

(b) Without loading a cassette tape and with pressing the record protecting switch with your finger tip, press the Record and Play buttons to set the N-1000ZXL in Record mode.

(c) Turn the Cam and bring the "PY" mark toward the pointer by hand. Reel Motor will rotate before the "PY" mark reaches the pointer. Adjust the value of R560 and R561 so that the voltage at the sliding contact of VR508 becomes −7 V (±0.3 V) when Reel Motor starts rotation.

(d) Observe the mute signal at the Q523 collector.
Turn the Cam referring to above step (c) and check to insure that the voltage at the sliding contact of VR508 is −7.2 V (±0.3 V) when mute is released (mute signal changes from H to L).
(This voltage is determined by the adjustment of R560 and R561 in above step (c).)

(e) Upon completion of the above adjustment, re-connect wires to the motor terminals.

4.2. Reel Motor Speed Adjustment in Play Mode

Refer to Fig. 4.3.

(1) Connect a DC voltmeter across the Reel Motor terminals.

(2) Without loading a cassette tape, set the N-1000ZXL in Play mode.

(3) Adjust VR501 on the Logic P.C.B. Ass'y to obtain 4 V on the DC voltmeter.

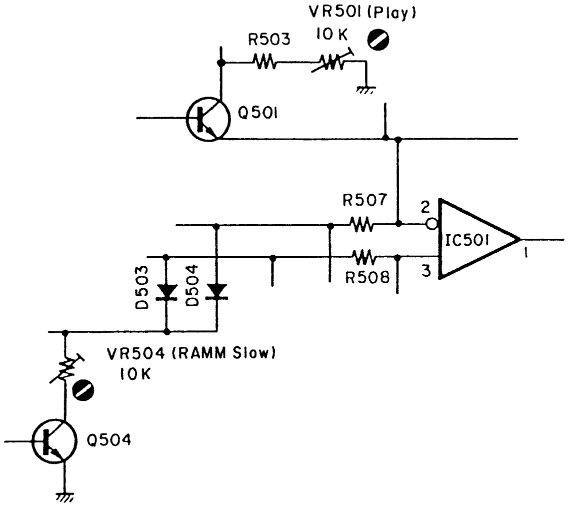


Fig. 4.3

4.3. RAMM Mode Adjustment

Before adjustment, disassemble the CPU P.C.B. Shield Plate, then remove 3 screws which are mounted on the CPU P.C.B. Ass'y.
Then lift the CPU P.C.B. Ass'y and insert connectors CN-43, 60 and 61 of the Test Unit into the connectors CN-43, 60 and 61 of the RAMM P.C.B. Ass'y. After the adjustment is completed, remove the Test Unit and assemble the CPU P.C.B. Shield Plate.

(1) Head Base Stroke Adjustment in RAMM Cue Mode

Refer to Figs. 4.4 and 4.5

(a) Load a Stroke Check Gauge M-9047 (DA09047B) in the N-1000ZXL.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-1000ZXL in RAMM mode.
Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.

(c) Check to insure whether the "C" pointer on the Playback Head Indicator indicates the left side line on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjust VR502 on the Logic P.C.B. Ass'y till satisfactory results are obtained.

(e) After completion of the above adjustment, set the N-1000ZXL in Stop mode, then set in RAMM mode again to see whether the adjustment is appropriately made.
If not, (b) through (e) will have to be repeated till satisfactory result is obtained.

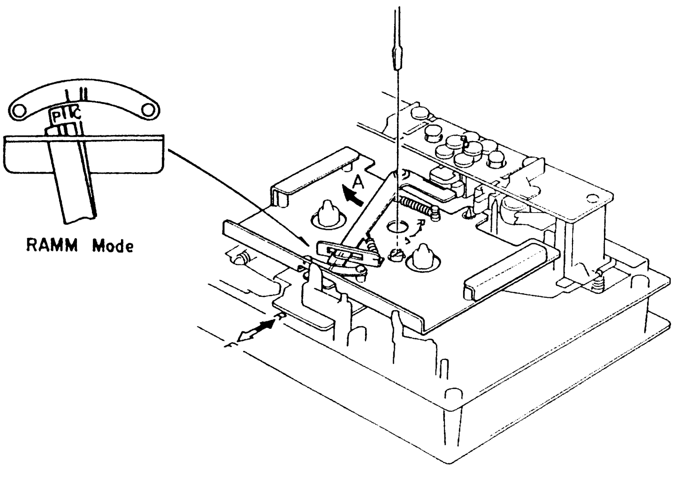


Fig. 4.4

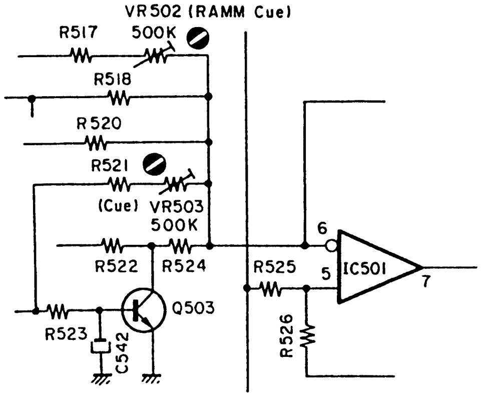


Fig. 4.5

(2) Reel Motor Speed Adjustment in RAMM Slow Mode

Refer to Fig. 4.3.

(a) Load a 5 Hz RAMM Speed Check Tape (DA09061A) in the N-1000ZXL.

(b) Connect a Frequency Counter to TP901 on the Detector P.C.B. Ass'y.

(c) Set SW25, SW26 and SW27 of the Test Unit to ON.

(d) Set the N-1000ZXL in Fast (F.F. or Rewind) mode, then adjust VR504 on the Logic P.C.B. Ass'y so that the reading of the Frequency Counter becomes in a range of 25 – 50 Hz (typically 37.5 Hz).
After the adjustment, check to insure that the reading is in a range of 25 – 50 Hz at 3 different portions (beginning, middle and end) of the tape.

(e) In Fast mode, by setting SW27 of the Test Unit to OFF, set the N-1000ZXL in RAMM Fast mode.
In this RAMM Fast mode, check to insure that the reading of the Frequency Counter is in a range of 80 – 240 Hz.
If not, repeat (b) – (e) till satisfactory result is obtained.

(f) Set SW25, SW26 and SW27 of the Test Unit to OFF, then set the N-1000ZXL in Stop mode.

(3) RAMM Detector Amp. Gain Adjustment

Refer to Figs. 4.6 – 4.8.

(a) Load a 5 Hz RAMM Speed Check Tape (DA09061A) in the N-1000ZXL.

(b) Connect a Synchroscope to TP901 on the Detector P.C.B. Ass'y. Set Synchroscope to DC mode and 1 V/cm vertical gain.
Check to insure that the minus level (–0.7 to –1.5 V) is observed on the Synchroscope as shown in Fig. 4.6.

(c) Set SW25, SW26 and SW27 of the Test Unit to ON.

(d) Set the N-1000ZXL in Fast (F.F. or Rewind) mode, then adjust VR901 on the Detector P.C.B. Ass'y so that the lowest plus peak value of waveforms does not lower than 2.5 V DC as shown in Fig. 4.7.

(e) By setting SW27 of the Test Unit to OFF (SW25 and SW26 are ON), set the N-1000ZXL in RAMM Fast mode, then check to insure that the lowest plus peak value of waveforms is higher than 0.5 V DC.
If not repeat (c) – (e) till satisfactory result is obtained.

(f) Set SW25, SW26 and SW27 to OFF, then set the N-1000ZXL in Stop mode.

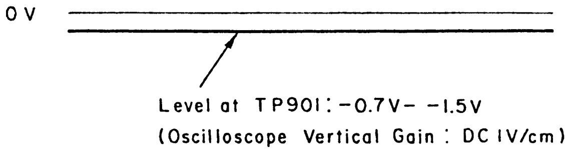


Fig. 4.6

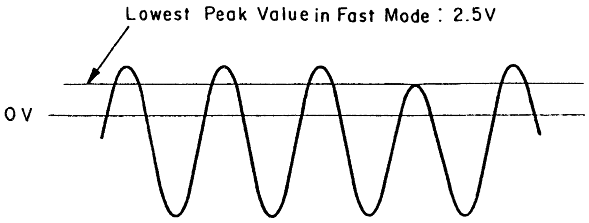


Fig. 4.7

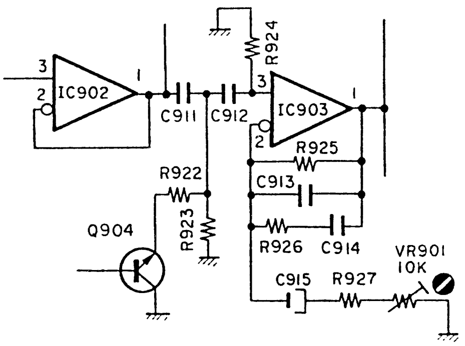


Fig. 4.8

4.4. Record Head and Playback Head Tilt Adjustment

Note: On items 4.4 – 4.10, refer to Fig. 4.9 flow chart. Refer to Figs. 4.10 and 4.11.

(1) Load a Tilt Check Gauge M-9039 (DA09039A) in the N-1000ZXL.

(2) Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the other end to the chassis of the N-1000ZXL.

(3) Remove both of the Height Gears.

(4) Set the N-1000ZXL in Play mode. Check to insure whether the Beacons Playback Head "Upper" or "Lower" and Record Head "Upper" or "Lower" are illuminating. In order not to give damages onto the head surfaces, push both of slide knobs of the Gauge to the direction of arrow marks, then return them to the original place to be in contact with record head and playback head surfaces after Play mode is securely locked.

(5) Check to insure freedom from contact between the Gauge and pad lifter.

(6) Beacon Playback Head "Lower" will light on when height adjustment screw (P) turned clockwise but Playback Head "Upper" when counterclockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob to the direction of an arrow mark and then return them to the original place.

(7) Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (R).

(8) Set the N-1000ZXL in Stop mode and fit both of the serrated height gears. Then set the N-1000ZXL again in Play mode and insure all of the 4 Beacons are illuminating. If not, (3) through (7) will have to be repeated till satisfactory results are obtained.

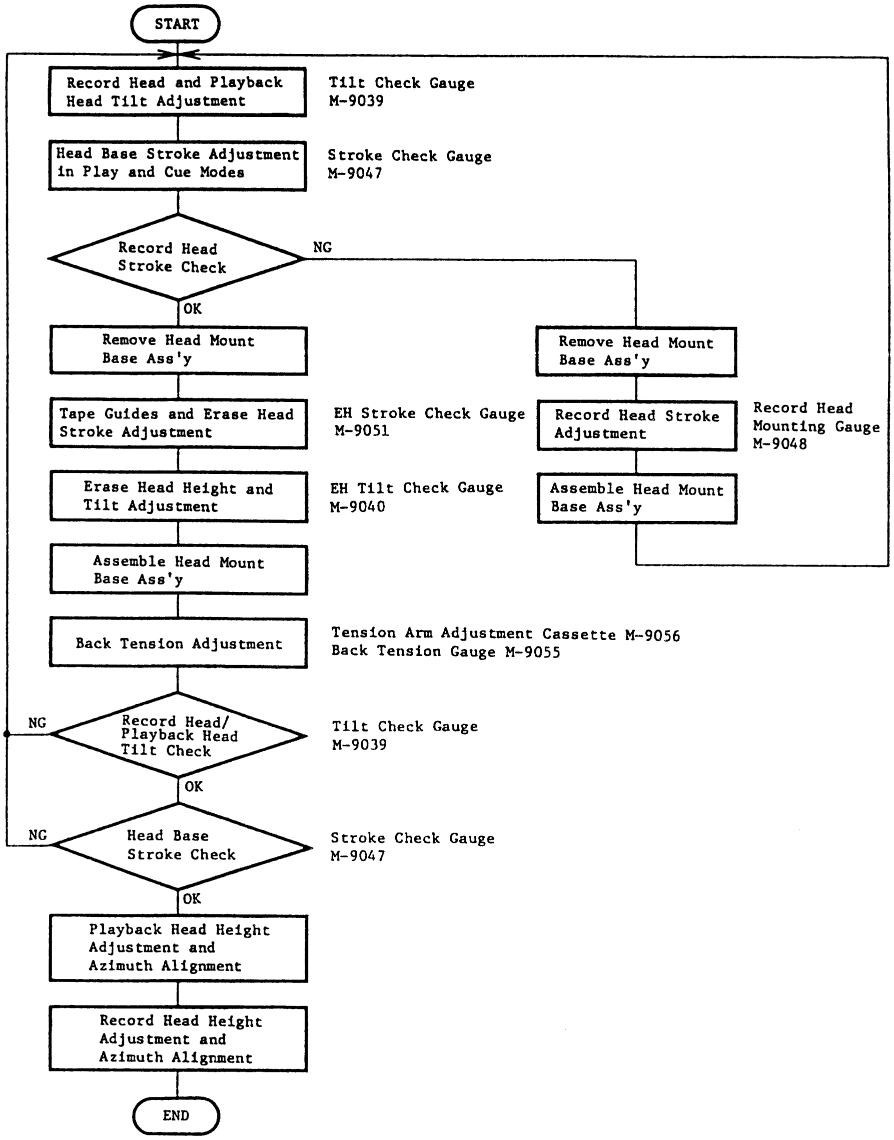

START
Record Head and Playback Head Tilt Adjustment
Tilt Check Gauge M-9039
Head Base Stroke Adjustment in Play and Cue Modes
Stroke Check Gauge M-9047
Record Head Stroke Check
NG
OK
Remove Head Mount Base Ass'y
Remove Head Mount Base Ass'y
Tape Guides and Erase Head Stroke Adjustment
EH Stroke Check Gauge M-9051
Record Head Stroke Adjustment
Record Head Mounting Gauge M-9048
Erase Head Height and Tilt Adjustment
EH Tilt Check Gauge M-9040
Assemble Head Mount Base Ass'y
Assemble Head Mount Base Ass'y
Back Tension Adjustment
Tension Arm Adjustment Cassette M-9056
Back Tension Gauge M-9055
NG
Record Head/ Playback Head Tilt Check
Tilt Check Gauge M-9039
OK
NG
Head Base Stroke Check
Stroke Check Gauge M-9047
OK
Playback Head Height Adjustment and Azimuth Alignment
Record Head Height Adjustment and Azimuth Alignment
END

Fig. 4.9

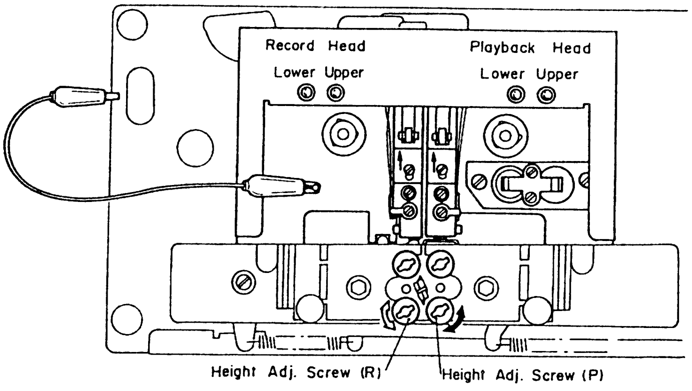

Record Head
Lower Upper
Playback Head
Lower Upper
Height Adj. Screw (R)
Height Adj. Screw (P)

Fig. 4.10

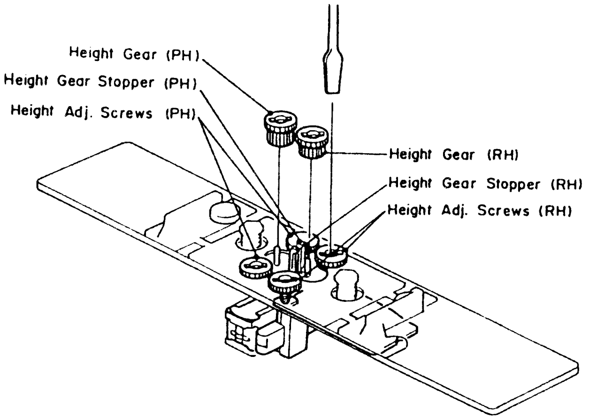

Height Gear (PH)
Height Gear Stopper (PH)
Height Adj. Screws (PH)
Height Gear (RH)
Height Gear Stopper (RH)
Height Adj. Screws (RH)

Fig. 4.11

4.5. Head Base Stroke Adjustment

Note: Before you conduct this adjustment, adjust with a "Tilt Check Gauge" to insure freedom from tilt on the playback head and record head.

(1) Head Base Stroke Adjustment in Play Mode

Refer to Fig. 4.12.

(a) Load a Stroke Check Gauge M-9047 (DA09047B) in the N-1000ZXL.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-I000ZXL in Play mode. Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.

(c) Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjustment can be made by moving the stroke adjuster assembled in the head base assembly (either forwardly or backwardly).

(e) Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Record Head Indicator, thus check can be made on record head stroke.

(f) If the record head stroke is noted to be misaligned, adjustment can be made with a Record Head Mounting Gauge M-9048 (DA09048A).

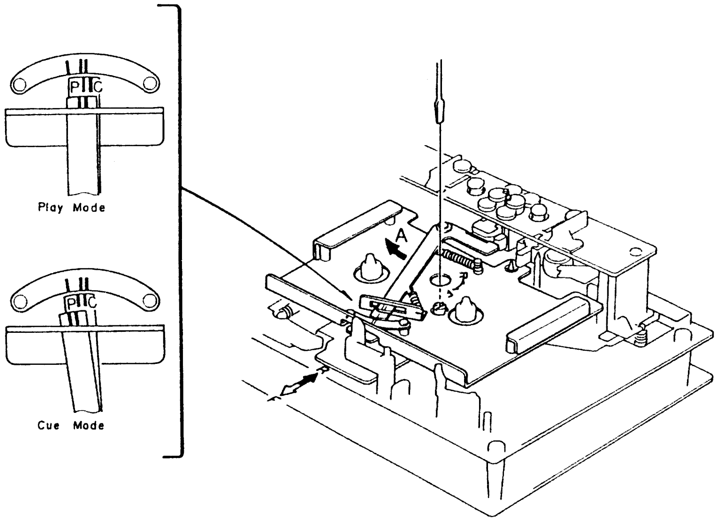


Fig. 4.12

(2) Head Base Stroke Adjustment in Cue Mode

Refer to Figs. 4.12 and 4.13.

(a) Load a Stroke Check Gauge M-9047 (DA09047B) in the N-1000ZXL.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-1000ZXL in Cue (F.F. and Pause) mode.
Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.

(c) Check to insure whether the "C" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjust VR503 on the Logic P.C.B. Ass'y till satisfactory results are obtained.

(e) After completion of the Head Base Stroke Adjustment, check to insure accuracy of the Head Base Stroke Adjustment in Play mode.
If the above are inaccurate, items (1) and (2) will have to be repeated till satisfactory results are obtained.

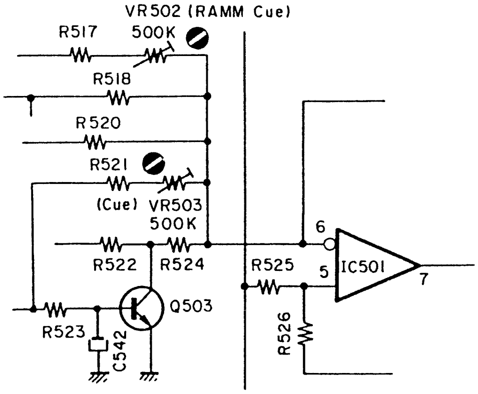


Fig. 4.13

4.6. Tape Guides Adjustment and Erase Head Stroke Adjustment

Remove Head Mount Base Ass'y referring to item 2.25. Refer to Figs. 4.14 and 4.15.

(1) Supply Tape Guide Height Adjustment

(a) Load an EH Stroke Check Gauge M-9051 (DA-09051A) in the N-1000ZXL.

(b) Set the N-1000ZXL in Play mode.

(c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, thus check can be made on supply tape guide height.

(d) If the supply tape guide is misaligned, the Supply Tape Guide Check Bar will not come into the supply tape guide. If such is noted, turn to adjust the height adjustment nut A till the Supply Tape Guide Check Bar is accepted by the supply tape guide.

(e) If the above are insured, set the N-1000ZXL in Pause mode, then in Play mode to see whether adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

(2) Take-up Tape Guide Height Adjustment

(a) Load an EH Stroke Check Gauge M-9051 (DA-09051A) in the N-1000ZXL.

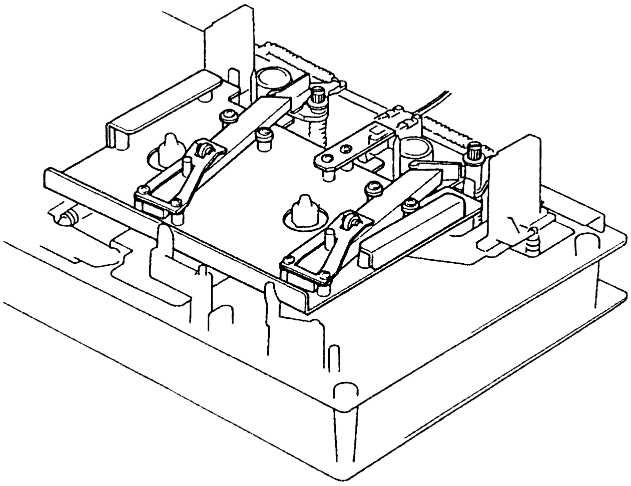


Fig. 4.14

(b) Set the N-1000ZXL in Play mode.

(c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, thus check can be made on take-up tape guide height.

(d) If the take-up tape guide is misaligned, the Take-up Tape Guide Check Bar will not come into the take-up tape guide. If such is noted, turn to adjust the height adjustment nut C till the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.

(e) If the above are insured, set the N-1000ZXL in Pause mode, then in Play mode to see whether adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

(3) Erase Head Stroke Adjustment

(a) Load an EH Stroke Check Gauge M-9051 (DA-09051A) in the N-1000ZXL.

(b) Set the N-1000ZXL in Play mode, thus check can be made on erase head stroke through the EH Stroke Indicator.

(c) Check to insure whether the erase head surface is aligned with red line on the EH Stroke Indicator. If not, adjust the erase head stroke by loosening 2 screws B that assembled erase head and erase head plate.

(d) After completion of adjustment, 2 pcs. of screws shall be locked with lock tight paint.

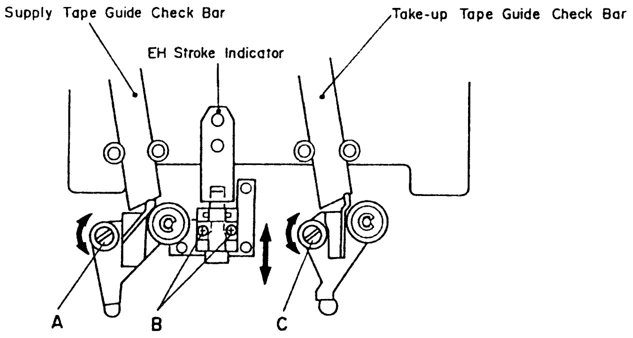


Fig. 4.15

4.7. Erase Head Height and Tilt Adjustment

Refer to Figs. 4.16 and 4.17.

(1) Remove Head Mount Base Ass'y referring to item 2.25.

(2) Load an EH Tilt Check Gauge M-9040 (DA09040A) in the N-1000ZXL.

(3) Set the N-1000ZXL in Stop mode.

(4) Check to insure whether one of the 3 Beacons is illuminating. Look down the mirror as shown by an arrow mark and slowly turn the Screw "Height" counterclockwise (or clockwise) so that the two horizontal lines on the mirror will become superposed on the line (in different color) of the erase head, and check to insure whether Beacon "1" is illuminating.

(5) Turn Screw "Tilt" counterclockwise (or clockwise) to light on Beacon "2". Excessive turning will cause the Beacon "1" to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the Beacons "1" and "2" illuminate.

(6) Turn Screw "Azimuth" counterclockwise or clockwise) to light on Beacon "3". Excessive turning will cause either Beacon "1" or "2" to light off, and therefore adjust with Screw "Azimuth" until all of the 3 Beacons "1", "2" and "3" illuminate.

(7) Check to insure whether the horizontal line on the mirror corresponds to that on the erase head. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.

(8) After completion of adjustment, 3 pcs. of screws shall be locked with lock tight paint.

Note: Before use of this gauge, check to insure freedom from dust or dirts, or overflow in the groove of the erase head surface.

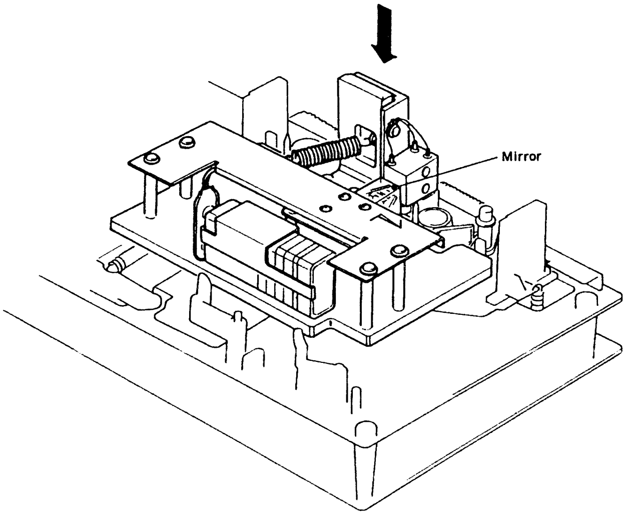


Fig. 4.16

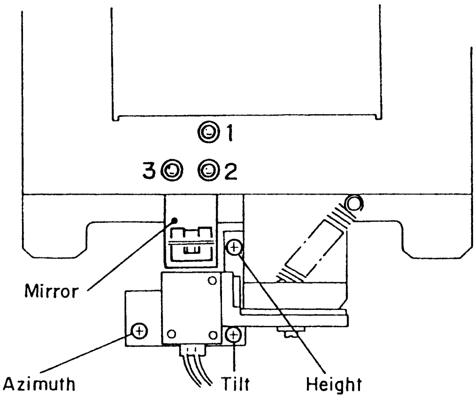


Fig. 4.17

4.8. Back Tension Adjustment

Refer to Figs. 4.18 – 4.21.

(1) Load a Tension Arm Adjustment Cassette (DA 09056A) in the N-1000ZXL referring to Fig. 4.18.

(2) Set the N-1000ZXL in Play mode.

(3) Bend the Back Tension Arm with pliers so that the gap between the Cassette Holding Spring assembled with the Head Base Ass'y and the Back Tension Arm becomes 0.5 mm as shown in Fig. 4.19. Do not bend the pointed end of the Back Tension Arm.

(4) Set the N-1000ZXL in Stop mode, and remove the Tension Arm Adjustment Cassette (DA09056A), then set the N-1000ZXL in Cue mode.
In Cue mode, check to insure that the gap is found between the Supply Reel Hub B Ass'y and the Felt of Back Tension Ass'y as shown in Fig. 4.20.

(5) Load the Back Tension Gauge (DA09055A) in the N-1000ZXL.

(6) Set the N-1000ZXL in Play mode and read the torque value of Back Tension Gauge.
If the value is in a range of 6 g-cm to 10 g-cm, adjustment is not necessary. If not, change the installation point of the Back Tension Spring as shown in Fig. 4. 21, and obtain the torque of 7 g-cm to 9 g-cm range.

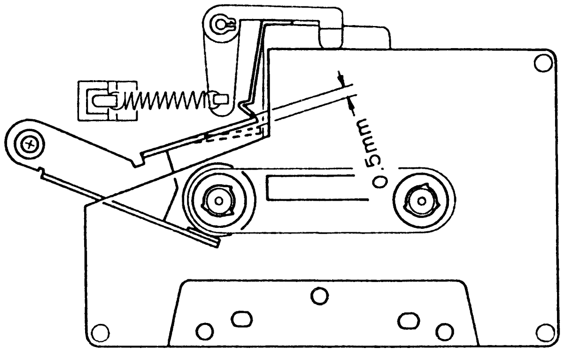


Fig. 4.19

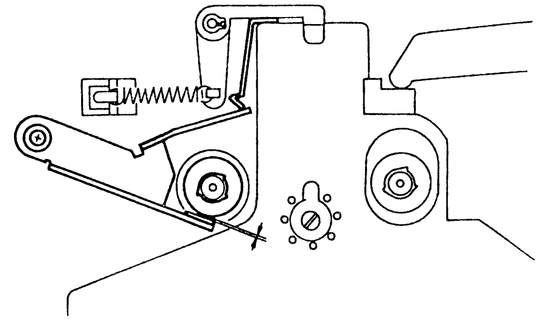


Fig. 4.20

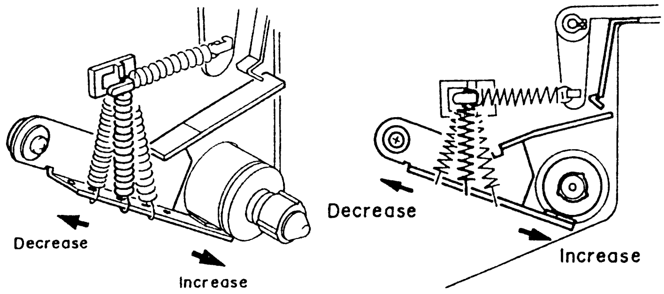


Fig. 4.21

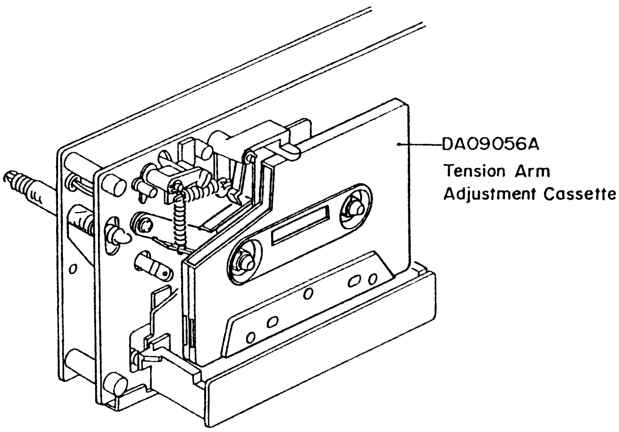


Fig. 4.18

4.9. Playback Head and Record Head Height Adjustment and Azimuth Alignment

(1) Playback Head Height Adjustment and Azimuth Alignment

Refer to Fig. 4.22.

(a) Set the Monitor switch to Tape, then connect a VTVM to the Line Output Jacks.

(b) Set the Manual Set button, then set the Eq. switch to 70 μs and Noise Reduction switch to Out.

(c) Load a 1 kHz Track Alignment Tape (DA09007A), then set the N-1000ZXL in Play mode.

(d) Turn the PH Height Gear until the outputs of both channels become minimum.

(e) Load a 15 kHz Azimuth Tape (DA09004A), then set the N-1000ZXL in Play mode.

(f) Turn the PH Azimuth Alignment Screw until the outputs of both channels become maximum.

(g) Repeat above steps (c) through (f) one or two times to obtain optimum performance.

(2) Record Head Height Adjustment and Azimuth Alignment

Refer to Figs. 4.22 – 4.26.

(a) Set the N-1000ZXL in Stop mode.
Turn the Azimuth Motor in the Azimuth Alignment Motor Ass'y by hand so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.23. Remove the Azimuth Alignment Wire by pulling out from the Azimuth Alignment Motor Ass'y. In this case, do not move the Slide Lever of the Azimuth Alignment Wire.

(b) Set the Monitor switch to Tape, then connect a VTVM to the Line Output Jacks.

(c) Set the Eq. switch to 70 μs and Noise Reduction switch to Out.

(d) Load a Reference SX Tape (DA09025A). Then set the N-1000ZXL in Record and Pause mode.

(e) With pressing the Auto Calibration button "Run", press the Play button to set the N-1000ZXL in Auto Calibration mode.

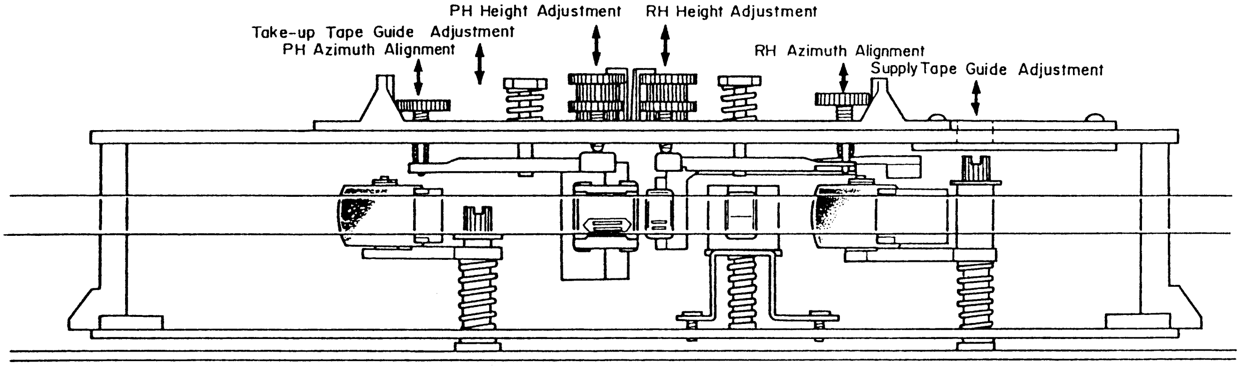

PH Height Adjustment
RH Height Adjustment
Take-up Tape Guide Adjustment
PH Azimuth Alignment
RH Azimuth Alignment
Supply Tape Guide Adjustment

Fig. 4.22

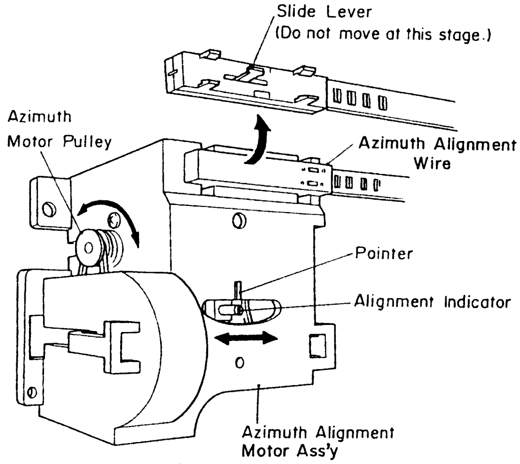

Slide Lever
(Do not move at this stage.)
Azimuth
Motor Pulley
Azimuth Alignment
Wire
Pointer
Alignment Indicator
Azimuth Alignment
Motor Ass'y

Fig. 4.23

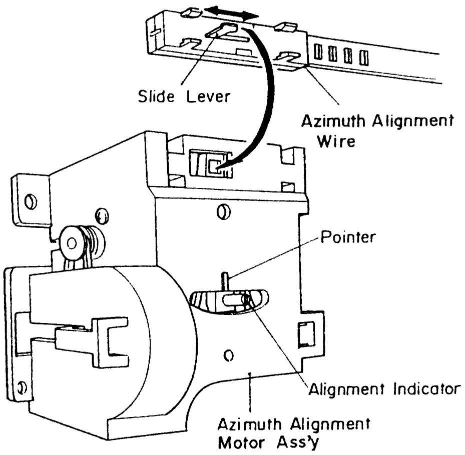

Slide Lever
Azimuth Alignment
Wire
Pointer
Alignment Indicator
Azimuth Alignment
Motor Ass'y

Fig. 4.24

Auto Azimuth Alignment button light starts flashing and Azimuth Alignment operation begins.

Referring to Fig. 4.25, adjust VR507 on the Logic P.C.B. Ass'y so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.23.

(f) When the Auto Azimuth Alignment operation is completed, Auto Azimuth Alignment button light goes out, then Auto Calibration of Bias, Level and Equalization is automatically carried out.

(g) After completion of the above Auto Calibration, tape is automatically rewound to "0000" and the Standby/Set button light is illuminated.

With pressing the Standby/Set button, press the Tape Memory button A, B, C, or D to store the information (Bias, Level and Equalization).

(h) Set the Test Tone switch to 400 Hz, then turn the RH Height Gear until the outputs of both channels become maximum.

(i) Feed in 15 kHz (−20 dB) and set the Test Tone switch to OFF, then set the N-1000ZXL in Record and Play mode.

Turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.

(j) Repeat above steps (h) and (i) one or two times to obtain optimum performance.

(k) Set the N-1000ZXL in Stop mode, then again set in Record and Pause mode.

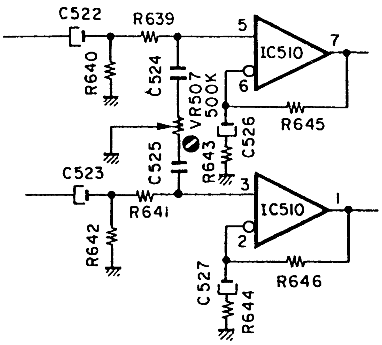


Fig. 4.25

(l) With pressing the Auto Azimuth Alignment button "Azimuth", press the Play button to set the N-1000ZXL in Auto Azimuth Alignment mode.

Check to insure whether the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y in the position of VR507 as adjusted in above step (e). If not, re-adjust VR507 to correspond the Alignment Indicator to the pointer of the Azimuth Alignment Motor Ass'y.

(m) Set the N-1000ZXL in Stop mode.

Mount the Azimuth Alignment Wire on the Azimuth Alignment Motor Ass'y referring to Fig. 4.24. (Correct the position of the Slide Lever of the Azimuth Alignment Wire by sliding by hand, then insert the Slide Lever into the receptacle of the Azimuth Alignment Motor Ass'y.)

(n) After completion of the above adjustment, record 400 Hz tone to the same portion of both sides A and B of the tape.

(o) Immerse the recorded tape in a magnetized developing solution. In turn, check to insure that the recording head tracks across the center are separated with a distance of 0.55 to 0.75 mm (typically 0.65 mm) as illustrated in Fig. 4.26.

Note: Liquid for tape magnetized development solution

"MAGNA-SEE SOUND CRAFT a product of CBS RECORDS a division of Columbia Broadcasting System, Inc., Danbury, Conn. 06810 U.S.A., or equivalent".

After development, clean the tape otherwise pressure rollers and heads will become dirty.

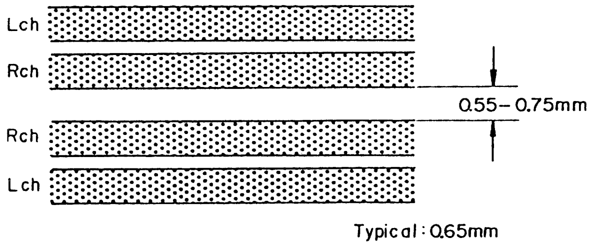


Fig. 4.26

4.10. Record Head Stroke Adjustment

Refer to Figs. 4.27 and 4.28.

Note: This adjustment will be required only to insure freedom from misalignment of the record head stroke in the record head stroke check mode.

(1) Check the accuracy of the record head stroke.

(2) Remove Head Mount Base Ass'y referring to item 2.25.

(3) Remove the record head assembly.

(4) Adjustment of Record Head Mounting Gauge M-9048 (DA09048A)
  (a) Mount the Block B onto the Mounting Gauge Plate.
  (b) Loosen the 2 screws fixing the Block A.
  (c) As shown in Fig. 4.27 hold the Gauges (3.05 mm and 0.1 mm thickness) between the Block A and Block B, fix the Block A with screws, pushing the Block A to the 2 guide pins.

(5) Remove the Block B from the Mounting Gauge Plate.

(6) As shown in Fig. 4.28, mount the R-8L record head assembly onto the Mounting Gauge Plate, then check the location of the R-8L record head surface. (If record head contacts to the Block C, loosen 2 pcs. of screws that are assembled record head and R-8L record head assembly, then place the R-8L record head assembly onto the Plate.)

(7) Remove the R-8L record head assembly from the Mounting Gauge Plate.

(8) Readjustment of Record Head Mounting Gauge M-9048 (DA09048A)
  (a) Mount the Block B onto the Mounting Gauge Plate.
  (b) Loosen the 2 screws fixing the Block A.
  (c) As shown in Fig. 4.27 hold the Gauges (3.05 mm and either one of 0.05, 0.15, 0.2, 0.25, 0.3 or 0.35 mm thickness) between the Block A and Block B, fix the Block A with screw, pushing the Block A to the 2 guide pins.

(9) Remove the Block B from the Mounting Gauge Plate.

(10) Mount the R-8L record head assembly onto the Mounting Gauge Plate.

(11) As shown in the Fig. 4.28, loosen the R-8L record head with 2 pcs. of screws onto the record head plate. As the location of the Block A is secured by the item (8)-(c), push the record head to the directions A and B, then tighten 2 pcs. of screws.

(12) Check to insure freedom from gap between the Block C and record head surface, then tighten the 2 pcs. of screws on the record head plate with lock tight paint.

(13) Assemble the record head assembly to the head mount base assembly.

(14) Assemble the head mount base assembly to the mechanism assembly.

(15) Check the record head stroke.

If the above are inaccurate, items (1) through (15) will have to be repeated till satisfactory results are obtained.

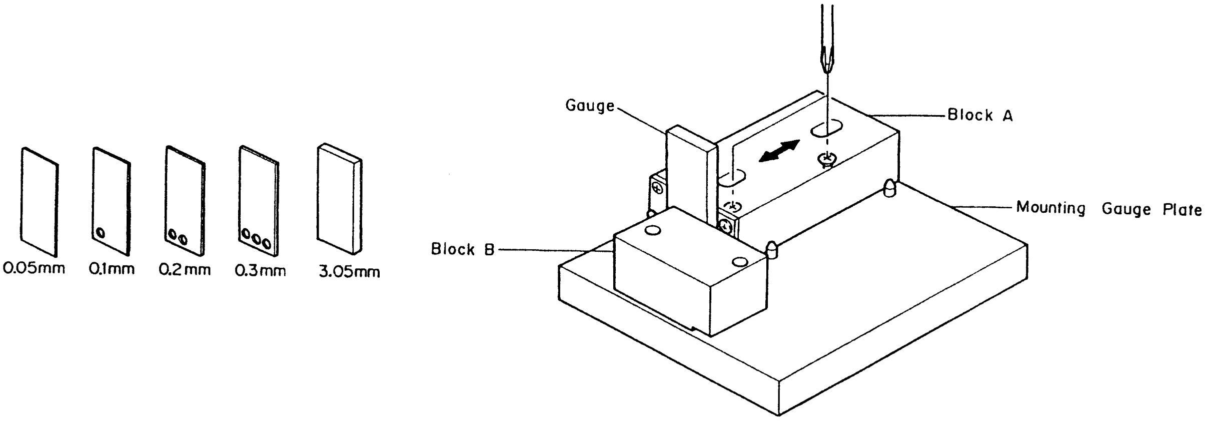


Fig. 4.27

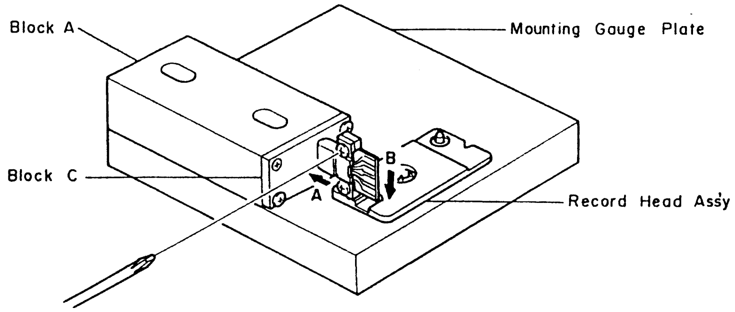


Fig. 4.28

4.11. Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EXII C-90 as shown in Fig. 4.29 (error will be made if a current type Tape Travelling Cassette (DA09011A) should be used for this purpose).

While modifying an EXII C-90, the tape guides in the cassette housing shall be kept protected to avoid tilt.

Check shall be made in the following procedures:

(1) An EXII C-90 Tape thus modified shall be loaded onto the N-1000ZXL.
(2) Release the back-tension (rotate the Supply Reel and feed out some length of tape) and set the N-1000ZXL in Play mode.
(3) In this juncture, check to insure whether the tape is free from waving or slippage from the tape guide.
(4) When the modified EXII C-90 is played back, check to insure whether the tape is freedom from waving from head surface or at pressure rollers.
(5) If either of waving or slippage from the tape guide should be noted, adjustments of "4.4. Record Head and Playback Head Tilt Adjustment". "4.5. Head Base Stroke Adjustment", "4.6. Tape Guides Adjustment and Erase Head Stroke Adjustment", "4.7. Erase Head Height and Tilt Adjustment", "4.8. Back Tension Adjustment", "4.9. Playback Head and Record Head Height Adjustment and Azimuth Alignment", "4.10. Record Head Stroke Adjustment", etc. will be required.

As a case may be, the said waving or slippage may have been caused from defective Supply Pressure Roller Ass'y or Take-up Pressure Roller Ass'y without parallel contact with capstans. If such is noted, the Pressure Roller Assemblies will have to be replaced.

Further, excessively weak take-up torque or strong take-up torque may cause defective tape travelling.

The N-1000ZXL is intended to be an adjustment-free Model, however if the similar matters as above should be noted, please replace the Reel Hub Ass'y to obtain appropriate take-up torque.

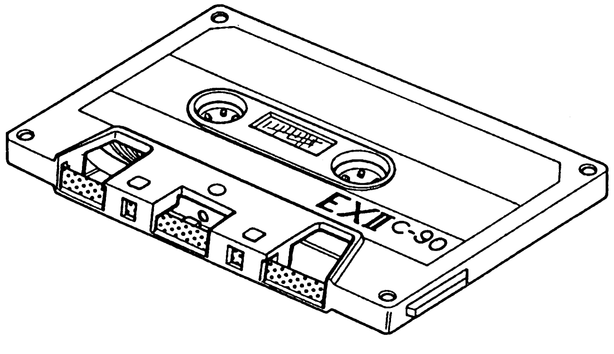


Fig. 4.29

4.12. Flywheel Holder Adjustment

(1) Refer to Fig. 4.30.
Tighten the Thrust Screws until the gap between the Flywheel Assemblies and Thrust Screws becomes minimized when both of the Capstan Shafts are moved backwardly and forwardly (the Thrust Springs between the Capstan Flanges and Flywheel Thrust Caps are in a flat state).
Excessive tightening of the Thrust Screws however will give damages on the Flywheel Assemblies, to which careful attention is invited.
(2) Return the Thrust Screws by 1/2 turn.
(3) Fixing the Thrust Screw with a screwdriver, lock the Lock Nut.
(4) Apply a quantity of lock tight paint to the Thrust Screws.

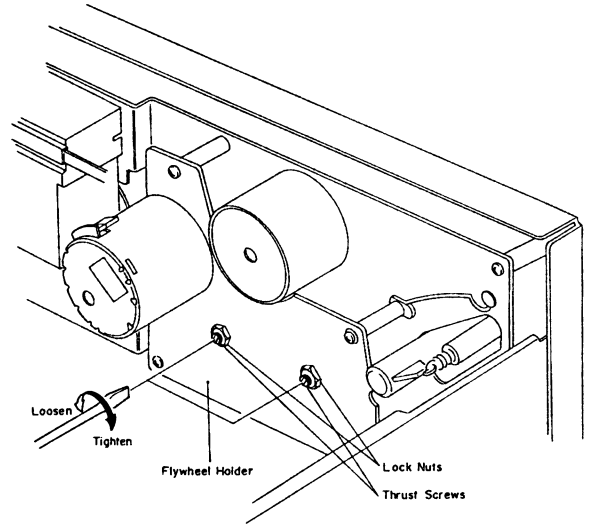


Fig. 4.30

4.13. Tape Speed Adjustment

(a) Remove the Cabinet Ass'y.
(b) Remove the CPU P.C.B. Ass'y.
(c) Connect a Frequency Counter to Line Output Jacks.
(d) Load a 3 kHz Speed Wow/Flutter Tape (DA09006A) and play it back.
(e) Referring to Fig. 4.31, adjust the Tape Speed Adjustment Volume VR501 on the Speed Cal. P.C.B. Ass'y to obtain 3,000 Hz on the Frequency Counter.

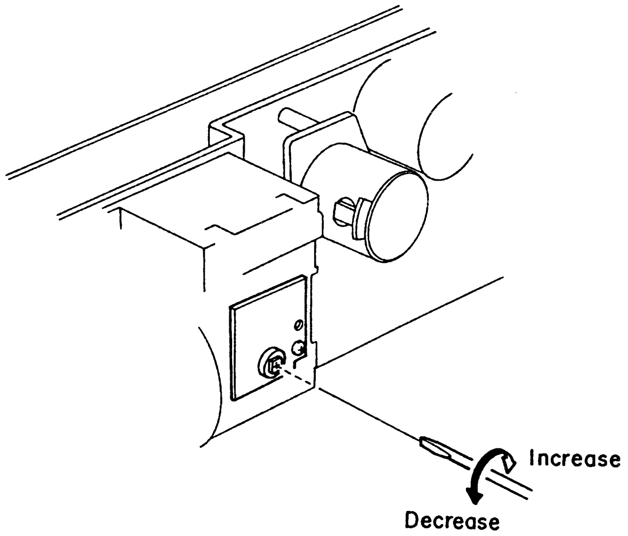


Fig. 4.31

4.14. Lubrication

N-1000ZXL is a lubrication-free cassette deck except when parts are replaced. Apply the following lubricant for each replaced part:

(1) LAUNA #100
Capstan Shaft
Pressure Roller Shaft
Thrust Cap
(2) FLOIL GB-TS-1
Reel Hub Shaft
Thrust portion on the Capstan Shaft
FLOIL GB-TS-1, made by Kanto Chemicals Co., Ltd., in Japan.
We suggest that you use the above or equivalent type.
If unavailable please contact Kanto Chemicals Co., Ltd., 2-7 Kanda Suda-cho Chiyoda-ku, Tokyo 101 Japan.
(3) Silicon Oil #3000CST
Air Damper Piston
Note: Excessive lubrication may cause defective damper action as the 0.2ϕ hole at the end of the cylinder may be filled with oil.

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

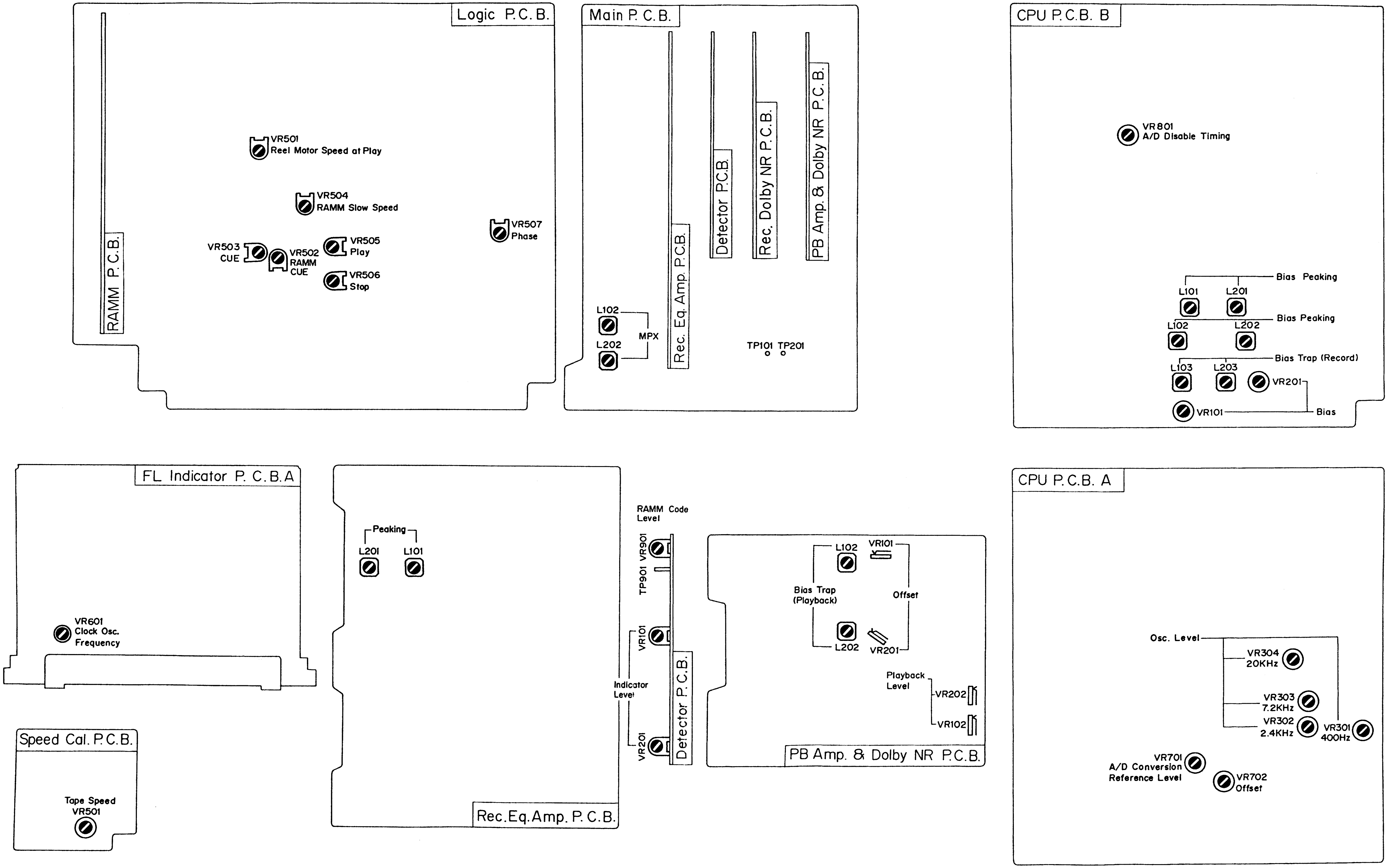

Logic P.C.B.
RAMM P.C.B.
VR501
Reel Motor Speed at Play
VR504
RAMM Slow Speed
VR507
Phase
VR503
CUE
VR502
RAMM
CUE
VR505
Play
VR506
Stop
Main P.C.B.
Rec. Eq. Amp. P.C.B.
Detector P.C.B.
Rec. Dolby NR P.C.B.
PB Amp. & Dolby NR P.C.B.
L102
L202
MPX
TP101 TP201
CPU P.C.B. B
VR801
A/D Disable Timing
Bias Peaking
L101
L201
Bias Peaking
L102
L202
Bias Trap (Record)
L103
L203
VR201
VR101
Bias
FL Indicator P.C.B.A
VR601
Clock Osc.
Frequency
Speed Cal. P.C.B.
Tape Speed
VR501
Peaking
L201
L101
Rec.Eq.Amp. P.C.B.
RAMM Code
Level
TP901 VR901
VR101
Indicator
Level
VR201
Detector P.C.B.
L102
VR101
Bias Trap
(Playback)
Offset
L202
VR201
Playback
Level
VR202
VR102
PB Amp. & Dolby NR P.C.B.
CPU P.C.B. A
Osc. Level
VR304
20KHz
VR303
7.2KHz
VR302
2.4KHz
VR301
400Hz
VR701
A/D Conversion
Reference Level
VR702
Offset

Fig. 5

6. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

6.1. Introduction

The N-1000ZXL incorporates a micro-processor which automatically calibrates the bias, level (sensitivity) and recording equalization to achieve an accurate frequency response of 20 Hz – 20 kHz when the auto calibration function is commanded.

To adjust the following steps manually, it is necessary to put the circuit to the desired adjustment condition.

The Test Unit is used for this purpose. Connect this unit with the N-1000ZXL and adjust manually the N-1000ZXL.

Step 10: Maximum Bias Current Adjustment
Step 11: Bias Trap (Record) Adjustment
Step 12: Bias Current Adjustment
Step 13: Oscillator Level Adjustment
Step 14: A/D Converter Offset Adjustment
Step 15: A/D Converter Frequency Response and Level Change Measurement

(1) How To Connect the Test Unit

(a) Remove the CPU P.C.B. Shield Plate referring to item 2.3-(3) on page 5, then unfasten 3 screws and turn over the CPU P.C.B. Ass'y referring to item 2.3-(4).
Thus, the CPU P.C.B. A Ass'y in the bottom of the CPU P.C.B. Ass'y becomes accessible.

(b) Connect the connectors CN-4, 5, 6, 7, 8 and 9 of the Test Unit to the test connectors CN-4, 5, 6, 7, 8 and 9 of the CPU P.C.B. A Ass'y respectively.

(c) When adjustments are completed, disassemble the Test Unit by reversing the above steps.

(2) How To Perform Switch Command

The Test Unit has 27 switches, SW1 – SW27. Preset switches SW3 – SW27 are of ON-OFF type, and Trigger switches SW1 and SW2 are of momentary type. Preset switches SW3 – SW24 are connected to the output ports and bidirectional ports of the micro-processor and a necessary command is set by the ON/OFF of SW3 – SW24. When the Trigger switch SW1 or SW2 is pressed, the command made by SW3 – SW24 is transmitted to the N-1000ZXL and the circuit of the N-1000ZXL is set in the required condition.

Table 6.1 shows the adjustment and the required switch condition of SW1 – SW24.

(3) How To Read LED Display

On step 13 "Oscillator Level Adjustment", the data of LEDs is used for adjustment. Each LED corresponds to the binary bit 2^7, 2^6, 2^5, 2^4, 2^3, 2^2, 2^1 and 2^0. Accordingly, when the LEDs display as follows, the binary data is defined to be 11001100.

(example)

LED: 2^7 (ON) 2^6 (ON) 2^5 (OFF) 2^4 (OFF) 2^3 (ON) 2^2 (ON) 2^1 (OFF) 2^0 (OFF)
Binary Data: 11001100 (Hexadecimal Data: CC)

In the adjustment, the subtraction of the fixed binary data 00010000 from the "Reference Level" data is required.

In this case, refer to the following examples (binary subtraction) and find the solution.

(example)

Reference Level: 11001001 (C9)
Fixed Data: –00010000 (10)
Subtracted Solution : 10111001 (B9)

$$\begin{array}{cccc} 1 & 1 & 10 & 100 \\ \underline{-0} & \underline{-1} & \underline{-01} & \underline{-001} \\ 1 & 0 & 01 & 011 \end{array}$$

Note: The data of the lowest bit is very small with respect to the whole data, therefore it can be neglected.

Table 6.1

ITEM	PRESET SW																						TRIGGER SW		REMARKS
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	
Step 10: Maximum Bias Current Adjustment	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Bias Osc.
	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Step 11: Bias Trap Adjustment (Record)	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Bias Osc.
	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Step 12: Bias Current Adjustment	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	Bias Current
	1	0	0	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
	0	1	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
	0	1	0	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
Step 13: Oscillator Level Adjustment	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Auto Eq.
	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	400 Hz 0 dB
	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	400 Hz -10 dB
	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	400 Hz -30 dB
	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2.4 kHz -30 dB
	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7.2 kHz -30 dB
	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	20 kHz -30 dB
Step 14: A/D Converter Offset Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	Offset Voltage
Step 15: A/D Converter Frequency Response and Level Change Measurement	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	8V -10 dB
	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5V -10 dB
	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	8V -30 dB

Note: SW3 – SW24: "1" – ON, "0" – OFF
SW1 and SW2: "1" – pressed, "0" – not pressed

6.2. Adjustment and Measurement Instructions

Note: Electrical adjustment should be performed after the mechanical adjustment is completed.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Tape Speed Adjustment	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Frequency Counter to Line Output Jacks	Playback	Speed Cal. P.C.B. VR501	Adjust VR501 to obtain 3 kHz ±0.5% on the frequency counter.
2	Playback Amp. Offset Adjustment	None	DC Voltmeter to Pin Nos. 1 and 7 of IC301 on Playback Amp. & Dolby NR P.C.B.	Stop	Playback Amp. & Dolby NR P.C.B. VR101, VR201	Adjust VR101 (VR201) to obtain DC 100 mV or less on the DC voltmeter.
3	Bias Trap Adjustment (Playback)	None	VTVM to Line Output Jacks	Record, Playback Monitor SW – Tape Eq. SW – 70 μs Noise Reduction SW – OUT Filter SW – OFF	Playback Amp. & Dolby NR P.C.B. L102, L202	1. To allow the adjustment of L102 (L202), remove the Playback Amp. & Dolby NR P.C.B. Ass'y from the Main P.C.B, then connect them by an Extension Card M-9058 (DA09058A). 2. Load a reference SX tape (DA09025A), then perform the auto calibration function as follows: a. Press the Record and Pause buttons. b. Pressing the Auto Calibration button "RUN", press the Play button. 3. Load a blank tape, then press the Record and Play buttons to set in record and play mode. 4. Adjust L102 (L202) to obtain a minimum reading on the VTVM. 5. After completion of above adjustment, assemble the Playback Amp. & Dolby NR P.C.B. Ass'y.
4	FL Indicator Level and Dynamic Range Adjustment	400 Hz (0dB/–20 dB) to Line Input Jacks	Frequency Counter to Pin No. 7 of IC605 on FL Indicator P.C.B. A and VTVM to TP101, TP201 on Main P.C.B.	Monitor SW – Source Test Tone – 400 Hz/OFF Meter SW – P. Hold or VU/Peak	Indicator P.C.B. A VR601 Detector P.C.B. VR101, VR201	1. Remove the FL Indicator Ass'y from the Front Chassis and disassemble the FL Indicator Case Cover referring to item 2.15. 2. Adjust VR601 to obtain 40.44 kHz clock on the frequency counter. 3. Adjust the Line Input level controls to obtain 90 mV on the VTVM. 4. Adjust VR101 (VR201) to obtain 0 dB on the FL level indicator. 5. Decrease the line input signal levels by 20 dB, then check whether the FL level indicators indicate –20 dB. If not, finely adjust VR601 so that the FL level indicators indicate –20 dB. 6. Repeat 3 – 5 till satisfactory results are obtained. 7. Assemble the FL Indicator Ass'y. 8. Set the Test Tone Switch to 400 Hz, then check whether the FL indicators indicate 0 dB. If not, adjust VR101 (VR201) to obtain 0 dB on the FL level indicators.
5	MPX Filter Adjustment	19 kHz ±100 Hz to Line Input Jacks	VTVM to Line Output Jacks	Monitor SW – Source Meter SW – P. Hold or VU/Peak Filter SW – MPX	Main P.C.B L102, L202	1. Set the Output level controls to max. 2. Adjust the Line Input level controls to obtain 1 V on the VTVM. 3. Set the Filter switch to MPX, then adjust L102 (L202) to obtain a minimum reading on the VTVM (the minimum reading will be less than -30 dB).
6	Playback Head Track Alignment	1 kHz Track Alignment Tape (DA09007A)	VTVM to Line Output Jacks	Playback Monitor SW – Tape Meter SW – P. Hold or VU/Peak Eq. SW – 70 μs Noise Reduction SW – OUT Filter SW – OFF	PH Height Gear	1. Press the Manual Set button. 2. Adjust the PH Height Gear to obtain minimum readings of both channels on the VTVM. 3. Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 4.9.

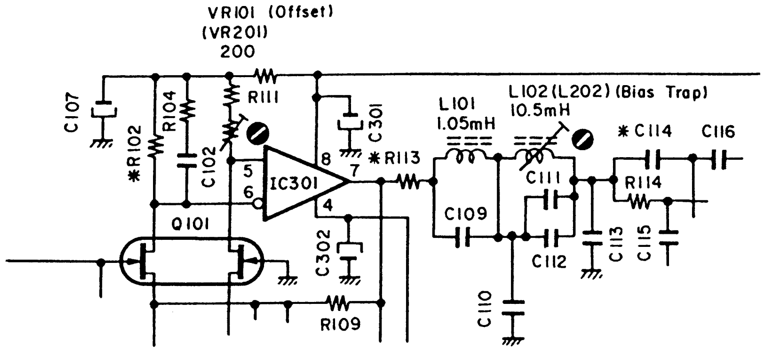


Fig. 6.2.1

2. Playback Amp. Offset

3. Bias Trap (Playback)

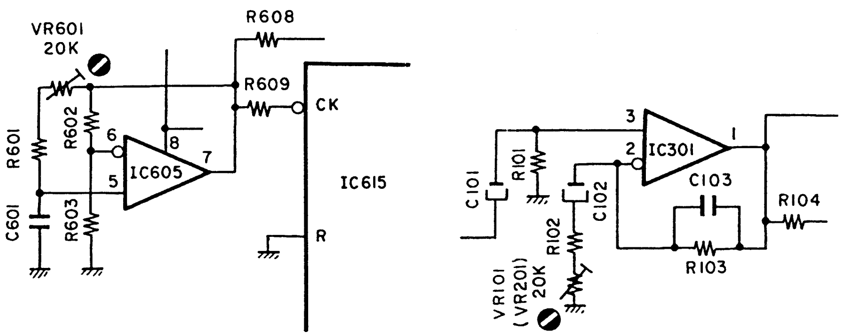


Fig. 6.2.2

4. FL Indicator Level and Dynamic Range

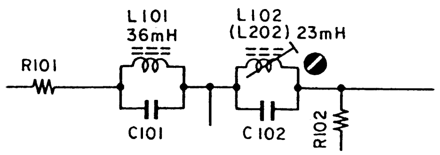


Fig. 6.2.3

5. MPX Filter

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
7	Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004A)	VTVM to Line Output Jacks	Playback Monitor SW – Tape Meter SW – P. Hold or VU/Peak Eq. SW – 70 µs Noise Reduction SW – OUT Filter SW – OFF	Playback Head Azimuth Alignment Screw	1. Press the Manual Set button. 2. Adjust the Playback Head Azimuth Alignment screw to obtain the maximum readings of both channels on the VTVM. Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 4.9. 3. Repeat above steps 6 and 7 one or two times to obtain optimum performance.
8	Playback Level Adjustment	400 Hz Level Tape (DA09005A)	VTVM to TP101, TP201 on Main P.C.B.	Same as above	Playback Amp. & Dolby NR P.C.B. VR102, VR202	1. Press the Manual Set button. 2. Adjust VR102 (VR202) to obtain 90 mV on the VTVM or 0 dB on the FL level indicator.
9	Playback Frequency Response Adjustment	400 Hz Level Tape (DA09005A) 10 kHz PB Frequency Response Tape (DA09003A) 15 kHz PB Frequency Response Tape (DA09002A) 20 kHz PB Frequency Response Tape (DA09001A)	VTVM to Line Output Jacks	Same as above		1. Press the Manual Set button. 2. Load a 400 Hz level tape and play it back. Set the Output level controls to a certain level (0 dB for example). 3. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes, then adjust the playback head azimuth to give maximum levels on the VTVM with each tape. 4. Read the maximum levels with each tape and check to insure that the levels against the 400 Hz level tape are within the following ranges. 10 kHz: –20 dB –1 dB to +2 dB 15 kHz: –20 dB –1 dB to +2 dB 20 kHz: –20 dB –1 dB to +2 dB 5. Conduct step 7 "Playback Head Azimuth Alignment". 6. If above is not sufficient, refer to "Playback Frequency Response Adjustment in item 6.3.
10	Maximum Bias Current Adjustment	None	VTVM across R125, R225 (CN-19-1, -3) on CPU P.C.B. B	Record, Pause Bias Bit – 10000000	CPU P.C.B. B L101, L201 L102, L202	1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1. 2. Perform the following procedures on the Test Unit, thus the bias bits of both channels are set to 10000000. (Refer to table 6.1.) a. Set SW10 to ON. b. Set SW4 to ON, then press the Trigger SW2. c. Set SW4, 6 to ON, then press the Trigger SW2. Note: Switch is OFF unless otherwise specified as ON. 3. Adjust L101 (L201) and L102 (L202) to obtain the maximum reading on the VTVM.
11	Bias Trap Adjustment (Record)	None	VTVM to terminals BM1, BM2 on CPU P.C.B. B	Record, Pause Bias Bit – 10000000	CPU P.C.B. B L103, L203	1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1. 2. Perform the following procedures on the Test Unit, thus the bias bits of both channels are set to 10000000. a. Set SW10 to ON. b. Set SW4 to ON, then press the Trigger SW2. c. Set SW4, 6 to ON, then press the Trigger SW2. 3. Adjust L103 (L203) to obtain a minimum reading on the VTVM.

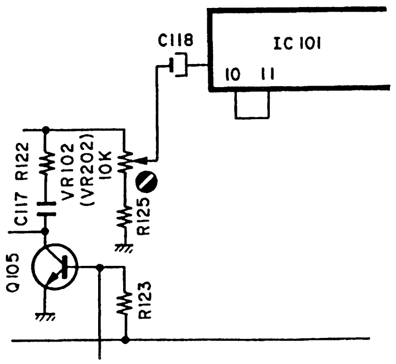


Fig. 6.2.4
8. Playback Level

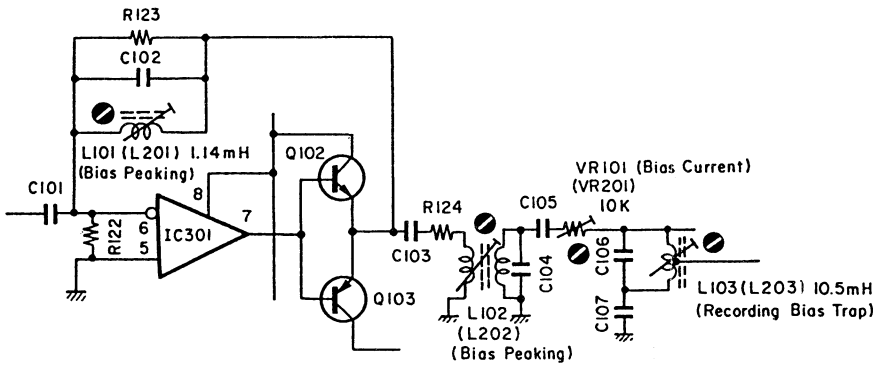


Fig. 6.2.5
10. Maximum Bias Current
11. Bias Trap (Record)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
12	Bias Current Adjustment	None	VTVM across R125, R225 (CN-19-1, -3) on CPU P.C.B. B	Record, Pause Bias Bit – 11111111	CPU P.C.B. B VR101, VR201	1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1. 2. Perform the following procedures on the Test Unit, thus the bias bits of both channels are set to 11111111. a. Set SW10, 11, 12 and 13 to ON. b. Set SW3 to ON, then press the Trigger SW2. c. Set SW3, 6 to ON, then press the Trigger SW2. d. Set SW4 to ON, then press the Trigger SW2. e. Set SW4, 6 to ON, then press the Trigger SW2. 3. Adjust VR101 (VR201) to obtain 80 mV on the VTVM.
13	Oscillator Level Adjustment	None	VTVM to TP101, TP201 on Main P.C.B.	Record, Pause	CPU P.C.B. A VR301 VR302 VR303 VR304 VR701	1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1. 2. Remove the Playback Amp. & Dolby NR P.C.B. Ass'y from the Main P.C.B. Ass'y referring to item 2.7, then connect the pin Nos. 4 (L ch.) and 5 (R ch.) of CN-47 on the Main P.C.B. Ass'y to the pin Nos. 3 (L ch.) and 5 (R ch.) of CN-49 on the Main P.C.B. Ass'y by jumper wires by soldering. 3. Adjustment of 400 Hz –10 dB oscillation level: a. Perform the following procedures on the Test Unit. 1) Set SW8, 10 to ON, then press the Trigger SW1 (Auto Eq.). 2) Set SW7, 13 to ON, then press the Trigger SW1 (400 Hz 0 dB). 3) Set SW9, 13 to ON, then press the Trigger SW1 (400 Hz –10 dB). b. Adjust VR301 to obtain 28.5 mV on the VTVM. c. Adjust VR701 so that the LEDs of the Test Unit display as follows: LED: 2^7(ON) 2^6(ON) 2^5(OFF) 2^4(OFF) 2^3(ON) 2^2(ON) 2^1(OFF) 2^0(OFF) Binary: 11001100 Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF. 4. Determination of the "Reference Level": a. Perform the following procedure on the Test Unit. 1) Set SW9, 10, 12 and 13 to ON, then press the Trigger SW1 (400 Hz –30 dB). b. Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF. Note the value of 8 LEDs' display. This certain value is determined as the "Reference Level". 5. Adjustment of 2.4 kHz –30 dB oscillation level: a. Perform the following procedure on the Test Unit. 1) Set SW7, 12 to ON, then press the Trigger SW1 (2.4 kHz –30 dB). b. Adjust VR302 so that the LEDs' display meets the "Reference Level". Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF. 6. Adjustment of 7.2 kHz –30 dB oscillation level: a. Perform the following procedure on the Test Unit. 1) Set SW7, 11 to ON, then press the Trigger SW1 (7.2 kHz –30 dB). b. Adjust VR303 so that the LEDs' display meets the "Reference Level". Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF. 7. Adjustment of 20 kHz –30 dB oscillation level: a. Perform the following procedure on the Test Unit. 1) Set SW7, 10 to ON, then press the Trigger SW1 (20 kHz –30 dB). b. Adjust VR304 so that the LEDs' display shows less value than the "Reference Level" by 00010000. for example: Reference Level: 11001001 –00010000 LEDs' Display: 10111001 Repeat to set SW14 to ON and OFF two or three times to insure that the display is fixed and unchangeable on OFF. 8. After completion of the above adjustment, disconnect the jumber wires between CN-47 and CN-49. And then assemble the Playback Amp. & Dolby NR P.C.B. Ass'y.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
14	A/D Converter Offset Adjustment	None	DC Voltmeter to Pin No. 1 of IC713 on CPU P.C.B. A	Stop	CPU P.C.B. A VR702	1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1. 2. Perform the following procedure on the Test Unit. a. Set SW15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 to ON (Offset Voltage). 3. Adjust VR702 to obtain a reading of 0 V ±50 mV on the DC voltmeter. 4. After completion of above adjustment, set the switches to OFF.
15	A/D Converter Frequency Response Measurement and A/D Converter Level Change Measurement	400 Hz (–10 dB/–20 dB/ –30 dB) and 20 kHz (–10 dB/–20 dB) to Line Input Jacks	VTVM to TP101 or TP201 on Main P.C.B. and DC Voltmeter to terminal CM8 on CPU P.C.B. A	Monitor SW – Source		1. Connect the Test Unit with the CPU P.C.B. A Ass'y referring to item 6.1. 2. Remove the Playback Amp. & Dolby NR P.C.B. Ass'y from the Main P.C.B. Ass'y referring to item 2.7, then connect the pin Nos. 4 (L ch.) and 5 (R ch.) of CN-47 on the Main P.C.B. Ass'y to the pin Nos. 3 (L ch.) and 5 (R ch.) of CN-49 on the Main P.C.B. Ass'y by jumper wires by soldering. 3. Perform the following procedure on the Test Unit. a. Set SW9, 10 to ON, then press the Trigger SW1 (8 V –10 dB). 4. Feed in 400 Hz –10 dB to the Line Input jacks. 5. Adjust the Line Input level controls to obtain 28.5 mV on the VTVM and then check to insure that the reading is 7.6 V ±1 V on the DC voltmeter. 6. Feed in 20 kHz –10 dB and check to insure that the reading is 7.2 V ±1 V on the DC voltmeter. 7. Feed in 400 Hz –20 dB and 20 kHz –20 dB and then check that each reading is 2.4 V ±0.4 V and 2.3 V ±0.4 V on the DC voltmeter. 8. After completion of above frequency response check, perform the following procedure on the Test Unit for level change check. a. Set SW9 to ON, then press the Trigger SW1 (5 V –10 dB). 9. Feed in 400 Hz –10 dB to the Line Input jacks. Adjust the Line Input level controls to obtain 28.5 mV on the VTVM and then check to insure that the reading is 4.9 V ±1 V on the DC voltmeter. 10. Perform the following procedure on the Test Unit. a. Set SW9, 10, 12 and 13 to ON, then press the Trigger SW1 (8 V –30 dB). 11. Feed in 400 Hz –30 dB to the Line Input jacks. Adjust the Line Input level controls to obtain 2.85 mV on the VTVM and then check to insure that the reading is 7.2 V ±1 V on the DC voltmeter. 12. After completion of above measurement, disconnect the jumper wires between CN-47 and CN-49. And then assemble the Playback Amp. & Dolby NR P.C.B. Ass'y. 13. Remove the Test Unit from the CPU P.C.B. A Ass'y referring to item 6.1.

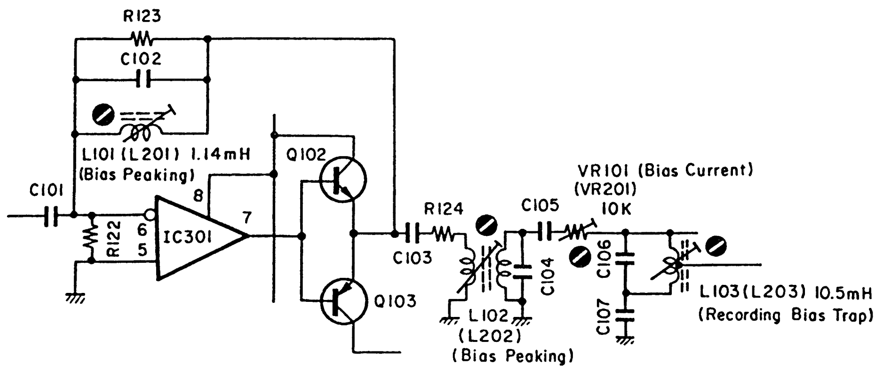

R123
C102
L101 (L201) 1.14mH
(Bias Peaking)
Q102
C101
R122
IC301
Q103
R124
C103
C105
VR101 (Bias Current)
(VR201)
10K
C104
C106
C107
L102
(L202)
(Bias Peaking)
L103 (L203) 10.5mH
(Recording Bias Trap)

Fig. 6.2.6
12. Bias Current

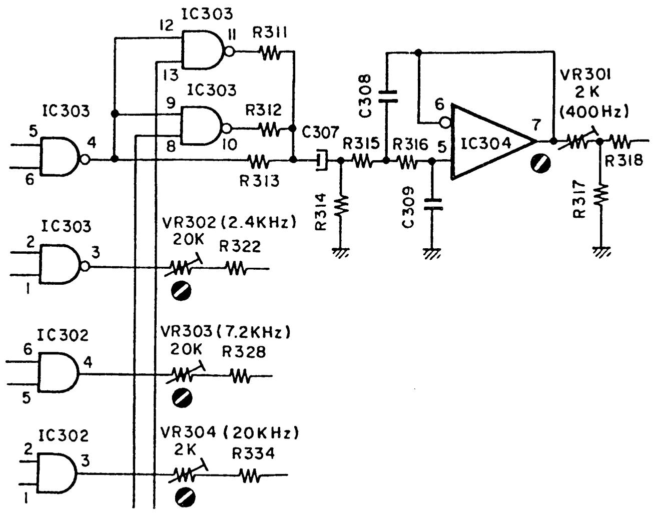

IC303
R311
IC303
R312
C307
C308
VR301
2K
(400Hz)
IC304
R313
R315
R316
R318
R314
C309
R317
VR302 (2.4KHz)
20K
R322
IC302
VR303 (7.2KHz)
20K
R328
VR304 (20KHz)
2K
R334

Fig. 6.2.7
13. Oscillator Level

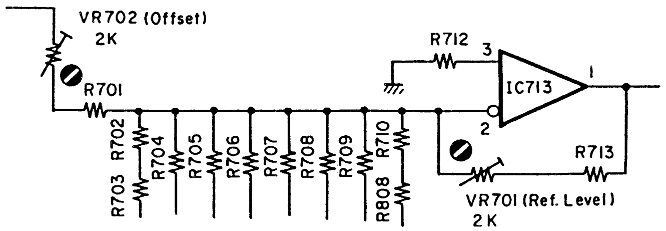

VR702 (Offset)
2K
R701
R712
IC713
R713
VR701 (Ref. Level)
2K
R702
R703
R704
R705
R706
R707
R708
R709
R710
R808

Fig. 6.2.8
13. Oscillator Level
14. A/D Converter Offset

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
16	Record Head Height Adjustment and Azimuth Alignment	Test Tone 400 Hz and 15 kHz –20 dB to Line Input Jacks	VTVM to Line Output Jacks	Record, Playback Monitor SW — Source Test Tone SW — 400 Hz/OFF Meter SW — P. Hold or VU/Peak Eq. SW — 70 μs Noise Reduction SW — OUT Filter SW — OFF	Head Height: RH Height Gear Azimuth Alignment: Record Head Azimuth Alignment Screw Logic P.C.B. VR507	1. In stop mode, turn the Azimuth Motor by hand so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.23. Remove the Azimuth Alignment wire by pulling out from the Azimuth Alignment Motor Ass'y. (In this case, do not move the Slide Lever of the Azimuth Alignment wire.) 2. Load a reference SX tape (DA09025A), then perform the auto calibration function as follows: a. Press the Record and Pause buttons to set in Record/Pause mode. b. Pressing the Auto Calibration button "Run", press the Play button. Tape counter becomes "0000" and Auto Azimuth Alignment button light starts flashing. After disappearing flashing, Bias, Level and Eq. will go to performance automatically. The tape is rewound to "0000", the Standby/Set button light and the Manual Set button light come on, and the auto calibration function is completed. 3. During the azimuth alignment operation in 2, adjust VR507 on the Logic P.C.B. so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.23. 4. Record Head Height Adjustment: a. Set the Test Tone switch to 400 Hz. Record signals on the reference SX tape (DA09025A), and then play it back. b. Adjust the RH Height Gear to obtain the maximum readings of both channels on the VTVM. 5. Record Head Azimuth Alignment: a. Set the Test Tone switch to OFF, then feed in 15 kHz (–20 dB). Record signals on the reference SX tape (DA09025A) and then play it back. b. Adjust the Record Head Azimuth Alignment Screw to obtain the maximum readings of both channels on the VTVM. c. Repeat 4 and 5 one or two times to obtain optimum performance. 6. Press the Stop button, then perform the auto azimuth alignment function as follows: a. Press the Record and Pause buttons. b. Pressing the Auto Azimuth Alignment button "Azimuth", press the Play button. The counter becomes "0000" and Auto Azimuth Alignment button light starts flashing. When alignment is completed, the button light goes out and the tape is automatically rewound to "0000". 7. During the auto azimuth alignment operation in 6, check to insure whether the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y at the position of VR507 as adjusted in 3. If not, re-adjust VR507 to correspond the Alignment Indicator to the pointer of the Azimuth Alignment Motor Ass'y. 8. Press the Stop button, then mount the Azimuth Alignment wire on the Azimuth Alignment Motor Ass'y referring to Fig. 4.24. 9. Perform the auto calibration function referring to 2. During the auto azimuth alignment operation, check to insure that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y. 10. Feed in 15 kHz (–20 dB). Record signals on the reference SX tape (DA09025A) and then play it back. Check to insure that the playback level is the same as the source monitor level for both channels.
17	A/D Converter Disable Timing Adjustment	None	Synchroscope to Pin No. 4 of IC809 on CPU P.C.B. B	Stop	CPU P.C.B. B VR801	1. Set the vertical gain of the synchroscope to 5 V/cm. 2. Perform the auto calibration function referring to step 16-2. During auto calibration operation, waveform in Fig. 6.2.10 is observed. 3. Adjust VR801 so that the high-level period of the waveform becomes 450 ms.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
18	Overall Frequency Response Adjustment	400 Hz (0 dB) and 20 Hz – 20 kHz (–20 dB) to Line Input Jacks	VTVM and Distortion Meter to Line Output Jacks	Record, Playback Monitor SW – Source/Tape Meter SW – P. Hold or VU/Peak Eq. SW – 120 µs (EX) 70 µs (SX/ZX) Noise Reduction SW – OUT Filter SW – OFF	Rec. Eq. Amp. P.C.B. L101, L201	For each tape to be used, perform the auto calibration function referring to step 16-2. 1. Set the Monitor switch to Source. 2. Feed in 400 Hz (0 dB), then adjust the Line Input level controls to obtain 0 dB on the FL level indicators. 3. Switch the generator output level to –20 dB. 4. Set the Monitor switch to Tape, then record and play it back. 5. Feed in 20 Hz – 20 kHz (–20 dB), then check to insure that the output levels are within –20 dB ±0.75 dB on the VTVM. 6. If above is not sufficient, adjust L101 (L201) to obtain –20 dB ±0.75 dB output level on the VTVM. 7. If a satisfactory result is not obtained, precise re-adjustment of step 9 "Playback Frequency Response", replacement of Playback Head or Record Head, check on item 4.11 "Tape Travelling Adjustment", or frequency adjustment according to item 6.3 will be required.
19	Crosstalk Measurement	1 kHz to Line Input Jacks	1 kHz Band Pass Filter and VTVM to Line Output Jacks	Record and Playback Monitor SW – Source/Tape Meter SW – P. Hold or VU/Peak Eq. SW – 70 µs Noise Reduction SW – OUT Filter SW – OFF		1. Erase a reference ZX tape (DA09037A) with a bulk eraser. 2. Load the tape, then perform the auto calibration function according to step 16-2. 3. Adjust the Line Input level controls to obtain 0 dB on the FL level indicators, then record the signals on the tape. 4. Turn the cassette tape the other way round and play it back. 5. Measure the difference between 3 and 4.
20	Channel Separation Measurement	1 kHz to Line Input Jacks	Same as above	Same as above		1. Erase a reference ZX tape (DA09037A) with a bulk eraser. 2. Load the tape, then perform the auto calibration function according to step 16-2. 3. Adjust the L ch. (R ch.) Line Input level control to obtain 0 dB on the FL level indicator, then close the R ch. (L ch.) Line Input level control. 4. Record and play it back, then measure the R ch. (L ch.) level.
21	Erasure Measurement	1 kHz to Line Input Jacks	Same as above	Same as above		1. Erase a reference ZX Tape (DA09037A) with a bulk eraser. 2. Load the tape, then perform the auto calibration function according to step 16-2. 3. Adjust the Line Input level controls to obtain 0 dB on the FL level indicators, then record the signals on the tape. 4. Rewind the tape then close the Line Input level controls. 5. Record and play it back, then measure the difference between 3 and 4.

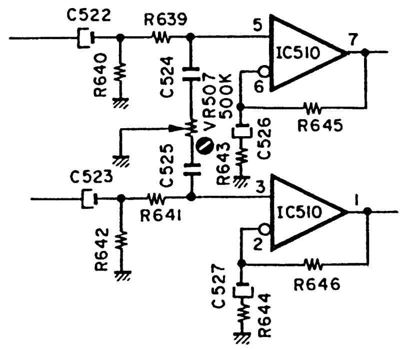


Fig. 6.2.9
16. Record Head Azimuth

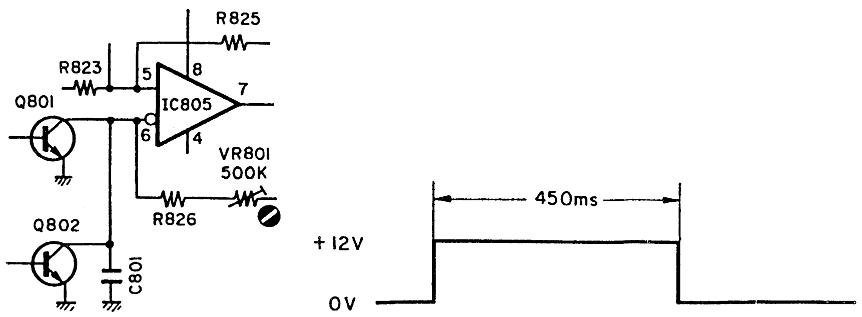


Fig. 6.2.10
17. A/D Converter Disable Timing

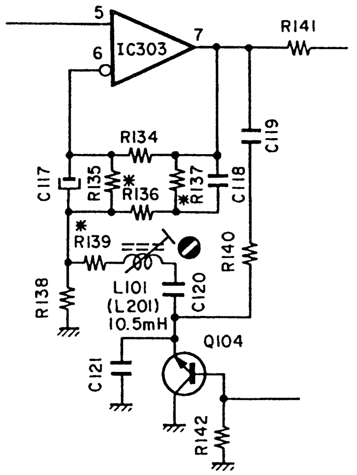


Fig. 6.2.11
18. Overall Frequency Response

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
22	Signal to Noise Ratio Measurement	400 Hz to Line Input Jacks	VTVM and Distortion Meter to Line Output Jacks	Record and Playback Monitor SW – Tape Meter SW – P. Hold or VU/Peak Eq. SW – 70 µs Noise Reduction SW – Dolby NR Filter SW – OFF		1. Load a reference ZX tape (DA09037A), then perform the auto calibration function according to step 16-2. 2. Feed in 400 Hz (0 dB), then record and play it back. 3. Adjust the Line Input level controls to obtain 3% total harmonic distortion in Playback mode. 4. Close the Line Input level controls then record again. 5. After rewound, play back and check the output level difference between 3 and 4. Note: The filter of IHF-A curve shall be used in the measurements.
23	Total Harmonic Distortion Measurement	400 Hz to Line Input Jacks	Distortion Meter to Line Output Jacks	Record and Playback Monitor SW – Source/Tape Meter SW – P. Hold or VU/Peak Eq. SW – 120 µs (EX) 70 µs (SX/ZX) Noise Reduction SW – OUT Filter SW – OFF		1. Load a reference ZX tape (DA09037A), then perform the auto calibration function according to step 16-2. 2. Set the Monitor switch to Source, then adjust the Line Input level controls to obtain 0 dB on the FL level indicators. 3. Set the Monitor switch to Tape, then record and play it back. 4. Read the distortion meter and check to insure that the distortion is less than 0.8% for ZX tape and 1.0% for SX and EXII tapes.
24	Subsonic Filter Measurement	10 Hz ±0.2 Hz to Line Input Jacks	VTVM to Line Output Jacks	Stop Monitor SW – Source Meter SW – P. Hold or VU/Peak Eq. SW – 70 µs Noise Reduction SW – OUT Filter SW – OFF/Subsonic		1. Set the Output level controls to max. 2. Adjust the Line Input level controls to obtain 1V on the VTVM. 3. Set the Filter switch to Subsonic, then check to insure that the readings of both channels are less than –55 dB on the VTVM.
25	Wow/Flutter Measurement	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Wow/Flutter Meter to Line Output Jacks	Playback Monitor SW – Tape Meter SW – P. Hold or VU/Peak Eq. SW – 70 µs		1. Press the Manual Set button. 2. Play back and read the wow/flutter meter.

6.3. Frequency Response Adjustment

(1) Playback Frequency Response Adjustment

Refer to Figs. 6.3.1 and 6.3.2.

(a) Level Adjustment (for middle frequency response)

This adjustment will be required if playback level is not sufficient when 10 kHz PB frequency response tape is played back as referred to step 9 in 6.2 "Adjustment and Measurement Instructions".

Playback equalization level is varied by the modification of R121 (R221) and R122 (R222) for 70 µs equalization and R110 (R210) for 120 µs equalization on the Playback Amp. & Dolby NR P.C.B. Ass'y. Following are the details for level modifications:

For 70 µs:

Approx. +1 dB	R121 (R221):	2.3K
	R122 (R222):	3.51K
0 dB	R121 (R221):	2.67K
	R122 (R222):	3.16K
Approx. -1 dB	R121 (R221):	3K
	R122 (R222):	2.67K

For 120 µs:

Approx. +1 dB	R110 (R210):	16.2K
0 dB	R110 (R210):	18K
Approx. -1 dB	R110 (R210):	20.5K

(b) Peaking Adjustment (for high frequency response)

This adjustment will be required if playback level is not sufficient when 20 kHz PB frequency response tape is played back as referred to step 9 in "Adjustment and Measurement Instructions".

Peaking portion compensates the gap loss of the playback head.

Peaking level is varied by the modification of R113 (R213) on the Playback Amp. & Dolby NR P.C.B. Ass'y as shown in Fig. 6.3.2. Typical value of R113 (R213) is 1 kΩ. The maximum and the minimum value of R113 (R213) should be 1.2 kΩ and 820 Ω.

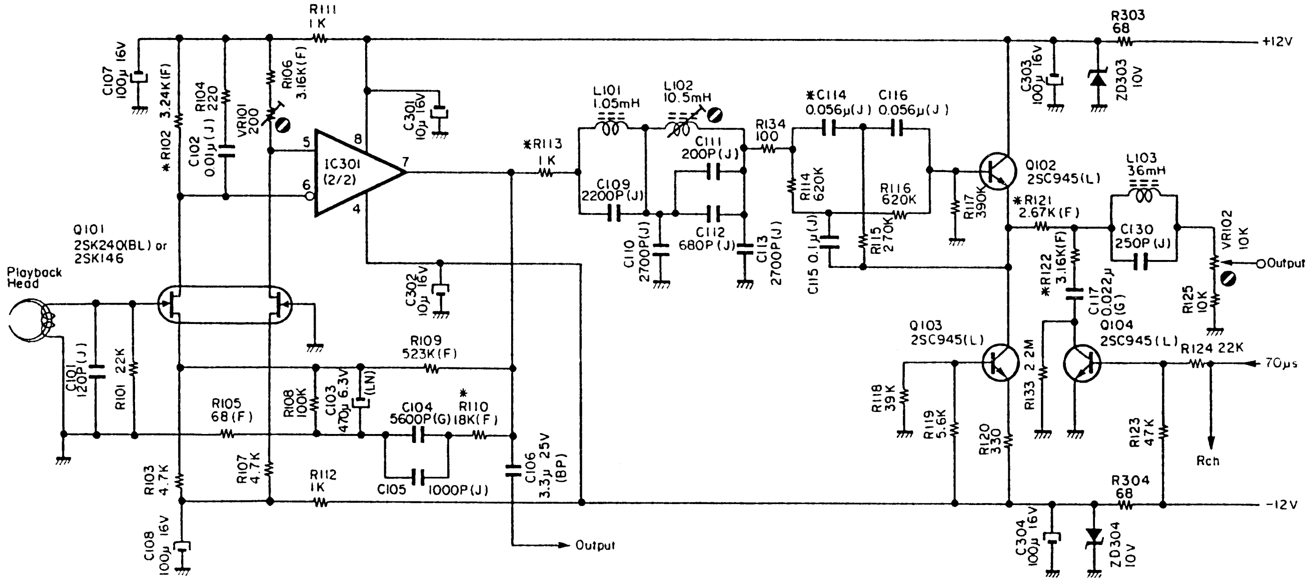

R111
1K
C107
100μ 16V
*R102 3.24K(F)
R104
220
C102
0.01μ(J)
VR101
200
R106
3.16K(F)
IC301
(2/2)
5
6
8
7
4
C301
10μ 16V
C302
10μ 16V
Q101
2SK240(BL) or
2SK146
Playback
Head
C101
120P(J)
R101 22K
R105
68(F)
R108
100K
C103
470μ 6.3V
(LN)
R109
523K(F)
C104
5600P(G)
R110
18K(F)
*
C105
1000P(J)
C106
3.3μ 25V
(BP)
R103
4.7K
R107
4.7K
R112
1K
C108
100μ 16V
Output
*R113
1K
L101
1.05mH
L102
10.5mH
C109
2200P(J)
C110
2700P(J)
C111
200P(J)
C112
680P(J)
C113
2700P(J)
R134
100
*C114
0.056μ(J)
C116
0.056μ(J)
R114
620K
R116
620K
R115
270K
C115 0.1μ(J)
R117
390K
Q102
2SC945(L)
*R121
2.67K(F)
*R122
3.16K(F)
C117
0.022μ
(G)
L103
36mH
C130
250P(J)
VR102
10K
R125
10K
Output
R303
68
+12V
C303
100μ 16V
ZD303
10V
Q103
2SC945(L)
Q104
2SC945(L)
R124 22K
70μs
R118
39K
R119
5.6K
R120
330
R133 2.2M
R123
47K
Rch
R304
68
-12V
C304
100μ 16V
ZD304
10V

Fig. 6.3.1 Playback Amp.

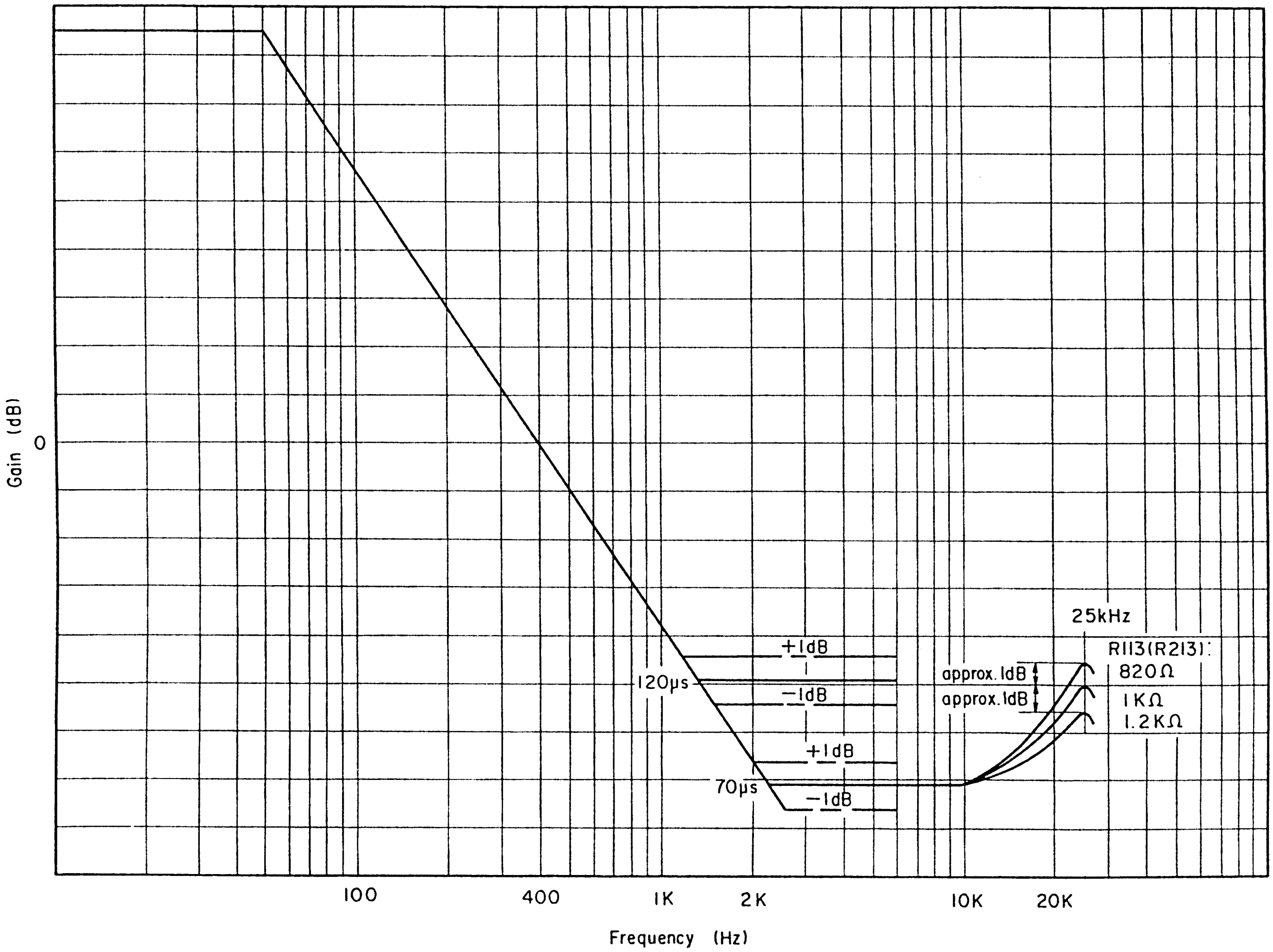


Fig. 6.3.2 Playback Equalization Curve

(2) Record Current Frequency Response

This adjustment will be made to compensate the overall frequency response after the playback frequency response adjustment is completed.

Before this adjustment, the following should be accurately adjusted.

- ○ Oscillator level adjustment on step 13 in item 6.2
  Each oscillator level of the 400 Hz –30 dB, 2.4 kHz –30 dB, 7.2 kHz –30 dB and 20 kHz –30 dB should be accurate.
- ○ Record head azimuth alignment on step 16 in item 6.2
  No misalignment is found when auto azimuth alignment function is completed.
- ○ Tape travelling adjustment in item 4.11

Note: Cassette tape to be used for frequency response adjustment should satisfy the quality.

(a) High-frequency Response Adjustment

Refer to Figs. 6.3.3 – 6.3.6.

Figs. 6.3.3 and 6.3.4 show the record peaking curve. Peaking frequency is adjusted by the adjustment of L101 (L201) and the peaking level is changed by the modification of R139 (R239).

If the frequency response shows the solid line as shown in Fig. 6.3.5, change the value of the resistor R139 (R239) on the Record Eq. Amp. P.C.B. Ass'y from 820 Ω to 680 Ω. If the dotted line, change it from 820 Ω to 1 kΩ.

Notes:
1. Since the distortion is increased when the resistor R139 or R239 is changed to greater value, re-check the distortion after R139 or R239 is changed.
2. The value of the R139 or R239 may be changed for adjustment in our factory.

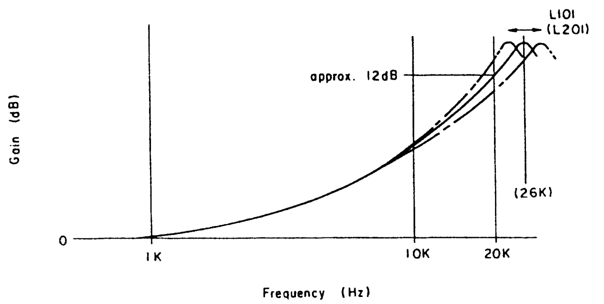


Fig. 6.3.3 Record Peaking Curve

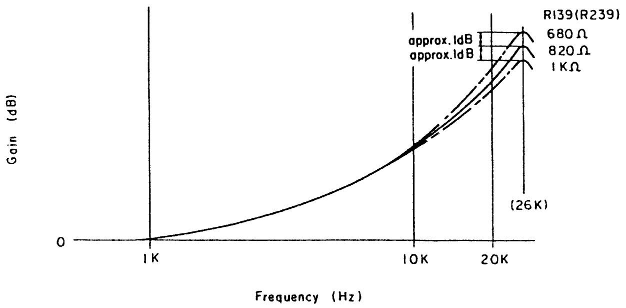


Fig. 6.3.4 Record Peaking Curve

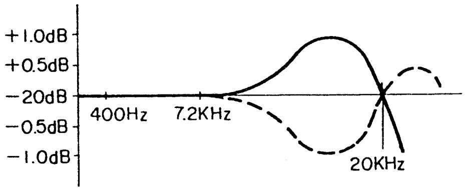


Fig. 6.3.5

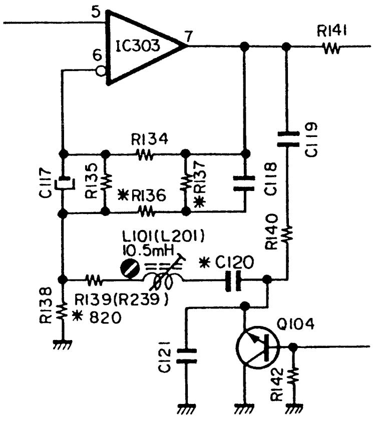


Fig. 6.3.6

(b) Low-frequency Response Adjustment

In general, the frequency response at low shows the response in Fig. 6.3.7. When the level at 400 Hz is considered to be 0 dB, the level at 20 Hz shows the minimum value (A) and the peak of the waveform produced by contour effect shows the maximum value (B). The peak of the waveform appears around the range of 40 – 80 Hz depending upon the playback head.

Adjustment procedures are as follows:

- ○ Check the level difference between the level at 20 Hz (A) and the peak level (B) of the waveform. If the difference is greater than 1.5 dB, perform the following adjustment 1).
- ○ If the frequency response at low is not within ±0.75 dB with respect to the level at 400 Hz, even though the level difference is less than 1.5 dB, perform the following adjustment 2).

1) Peak-to-peak level adjustment

Adjust so that the level difference between (A) and (B) in Fig. 6.3.7 becomes less than 1.5 dB.

a) Add capacitor C1 0.015 μF in parallel to C114 (C214) on the Playback Amp. & Dolby NR P.C.B. Ass'y as shown in Fig. 6.3.8.
This will compensate approx. 0.2 dB.

b) If compensation is still insufficient, add resistor R1 2.2 MΩ – 560 kΩ in parallel to R136 (R236) on the Record Eq. Amp. P.C.B. Ass'y as shown in Fig. 6.3.9. When 560 kΩ is added, approx. 0.3 dB will be compensated.

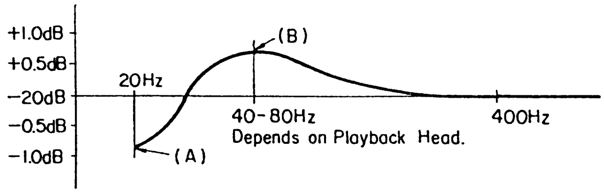
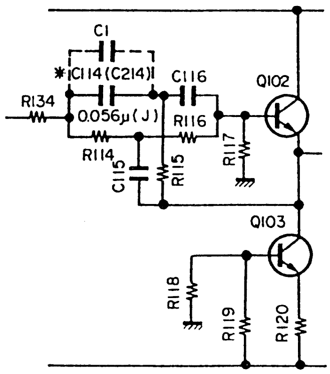
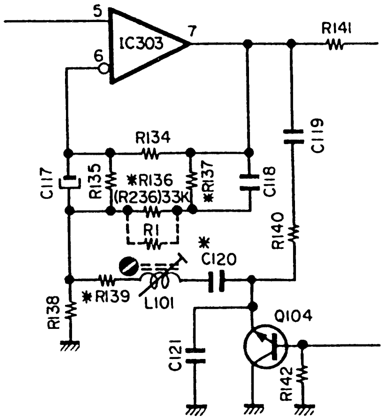


Fig. 6.3.7



C1
*C114 (C214)
C116
Q102
R134
0.056μ (J)
R116
R114
C115
R115
R117
Q103
R118
R119
R120

Fig. 6.3.8



5
IC303
6
7
R141
C119
R134
C117
R135
*R136
(R236)33K
*R137
C118
R1
R140
*
C120
*R139
L101
R138
Q104
C121
R142

Fig. 6.3.9

2) Level Adjustment

Adjust so that the level differences between 400 Hz and 20 Hz (A) and between 400 Hz and the peak value (B) of the waveform become equal. Refer to Fig. 6.3.10.

a) Decreasing of level

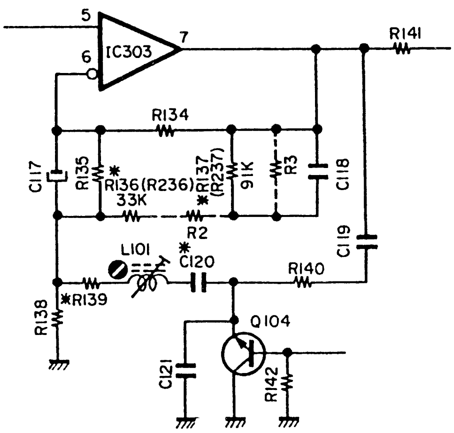
Add resistor R2 in series with R136 (R236) on the Record Eq. Amp. P.C.B. Ass'y.

Additional R2	Decreased level
3.3 kΩ	0.5 dB
2.2 kΩ	0.35 dB
1 kΩ	0.15 dB

b) Increasing of Level

Add resistor R3 in parallel to R137 (R237) on the Record Eq. Amp. P.C.B. Ass'y.

Additional R3	Increased level
470 kΩ	0.5 dB
1 MΩ	0.2 dB



5
6
IC303
7
R141
R134
C117
R135
*
R136 (R236)
33K
R137 (R237)
*
91K
R3
C118
R2
*
C119
L101
C120
R140
*R139
R138
Q104
C121
R142

Fig. 6.3.10

6.4. Dolby NR Circuit Check

Dolby NR circuit incorporates a Dolby B-Type NR IC (μA7300PC) which has no adjustment point.

Perform the following checks and make sure that the IC operates accurately i.e. accuracy of frequency response through IC.

(1) Playback Dolby NR Circuit

Signal Source: 5 kHz to pin No.12 of IC101 and IC201
Output Connection: VTVM to the test points TP101 and TP201 on the Main P.C.B.
Mode: Stop
Monitor SW – Tape
Noise Reduction SW – Out/Dolby NR

(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B.
Feed in 5 kHz to pin No. 12 of IC101 (IC201) and adjust the generator output control so that the VTVM may read 7.6 mV at each test point.

(b) Set the Noise Reduction switch to Dolby NR. Check to insure that the level at TP101 (TP201) is 3 mV ±1.5 dB.

(2) Record Dolby NR Circuit

Signal Source: 5 kHz to Line Input Jacks
Output Connection: VTVM to the output side of C121 (C221) on the Record Dolby NR P.C.B.
Mode: Stop
Monitor SW – Source

(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B.
Feed in 5 kHz and adjust the Line Input level controls so that the VTVM may read 100 mV (0 dB) at each test point.
FL level indicators will indicate 0 dB.

(b) Remove the VTVM from TP101 (TP201) and reconnect it to the output side of C121 (C221). Check to insure that the VTVM indicates approx. 560 mV.

(c) Decrease the input level (0 dB) by 20 dB or 30 dB. Check to insure that the level at output side of C121 (C221) corresponds to the following with Noise Reduction switch Out (Dolby NR OUT) and Dolby NR (Dolby NR IN).

Input Level	Capacitor Output Level		
(f=5 kHz)	Dolby NR OUT	Dolby NR IN	Difference between IN and OUT
−20 dB	−20 dB	−16.8 dB ± 1.5 dB	3.2 dB ± 1.5 dB
−30 dB	−30 dB	−21.8 dB ± 1.5 dB	8.2 dB ± 1.5 dB

7. MOUNTING DIAGRAMS AND PARTS LIST

Note: Mounting diagram shows a dip side view of the printed circuit board.

7.1. Fuse P.C.B. Ass'y

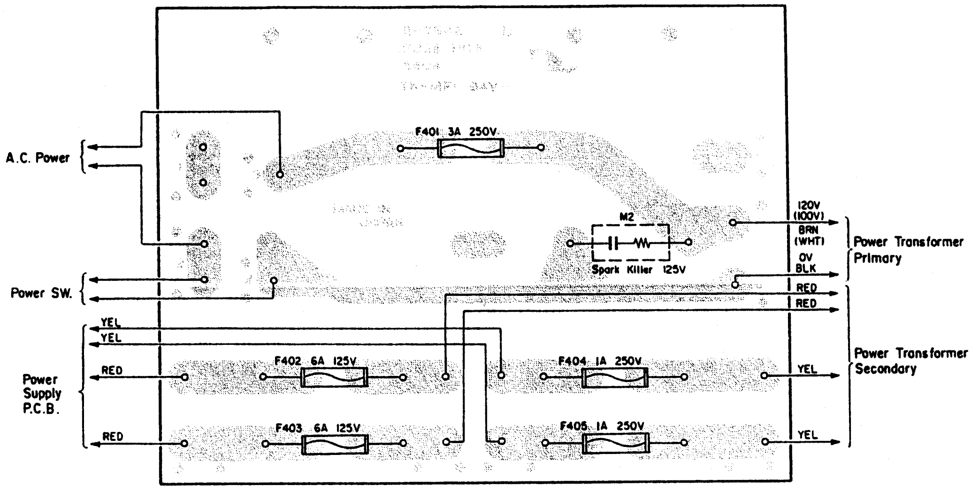

A.C. Power
F401 3A 250V
M2
Spark Killer 125V
120V (100V)
BRN (WHT)
0V
BLK
Power Transformer Primary
Power SW.
RED
RED
YEL
YEL
Power Supply P.C.B.
RED
F402 6A 125V
F404 1A 250V
YEL
Power Transformer Secondary
RED
F403 6A 125V
F405 1A 250V
YEL

Fig. 7.1.1 U.S.A., Canada & Others

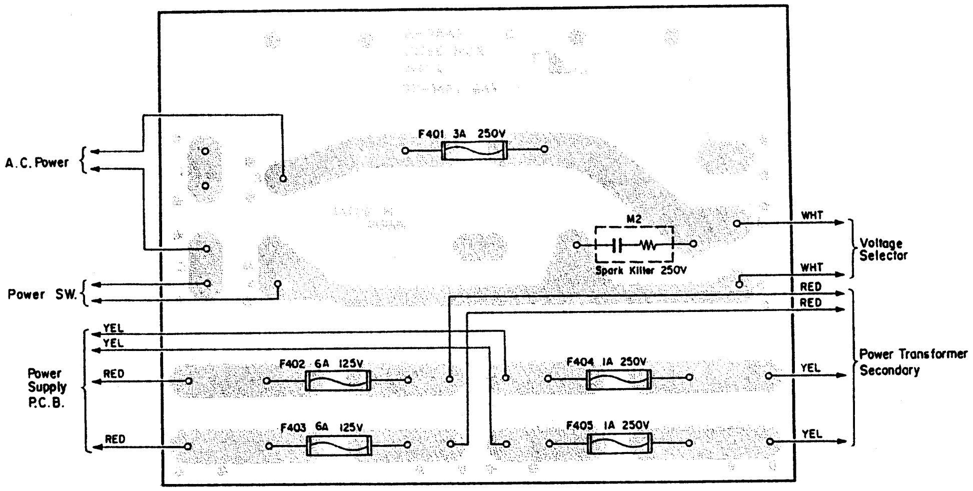

A.C. Power
F401 3A 250V
M2
Spark Killer 250V
WHT
Voltage Selector
WHT
Power SW.
RED
RED
YEL
YEL
Power Supply P.C.B.
RED
F402 6A 125V
F404 1A 250V
YEL
Power Transformer Secondary
RED
F403 6A 125V
F405 1A 250V
YEL

Fig. 7.1.2 Japan

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04256A	Fuse P.C.B. Ass'y (U.S.A., Canada & Others)		BA04257A	Fuse P.C.B. Ass'y (Japan)
	0B07842D	Fuse P.C.B.		0B07842D	Fuse P.C.B.
F401	0B08369A	Fuse 3A 250V	F401	0B08781A	Fuse 3A 250V
F402,403	0B08371A	Fuse 6A 125V	F402,403	0B08782A	Fuse 6A 125V
F404,405	0B08374A	Fuse 1A 250V	F404,405	0B08686A	Fuse 1A 250V
	0B08342A	Spark Killer (1 pce.)		0B08363A	Spark Killer (1 pce.)
	0M04187A	Fuse Label 3A 250V (1 pce.)		0M04187A	Fuse Label 3A 250V (1 pce.)
	0M04189A	Fuse Label 6Ax2 (1 pce.)		0M04189A	Fuse Label 6Ax2 (1 pce.)
	0M04078B	Fuse Label 1Ax2 (1 pce.)		0M04078B	Fuse Label 1Ax2 (1 pce.)
	0E00752A	Eyelet 2x3 (6 pcs.)		0E00752A	Eyelet 2x3 (6 pcs.)
				0B08349A	Fuse Clip (4 pcs.)

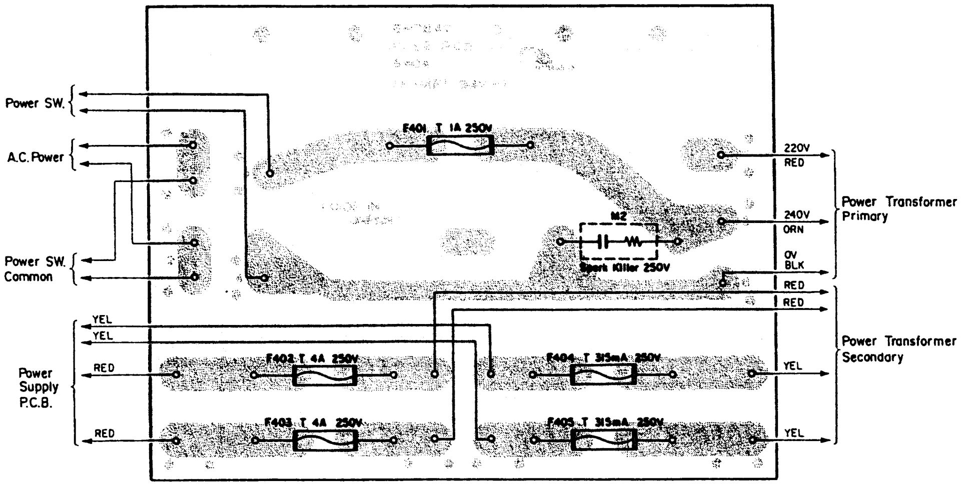

Power SW.
A.C. Power
Power SW. Common
Power Supply P.C.B.
YEL
YEL
RED
RED
F401 T 1A 250V
M2
Spark Killer 250V
F402 T 4A 250V
F403 T 4A 250V
F404 T 315mA 250V
F405 T 315mA 250V
220V RED
240V ORN
0V BLK
RED
RED
YEL
YEL
Power Transformer Primary
Power Transformer Secondary

Fig. 7.1.3 UK & Australia

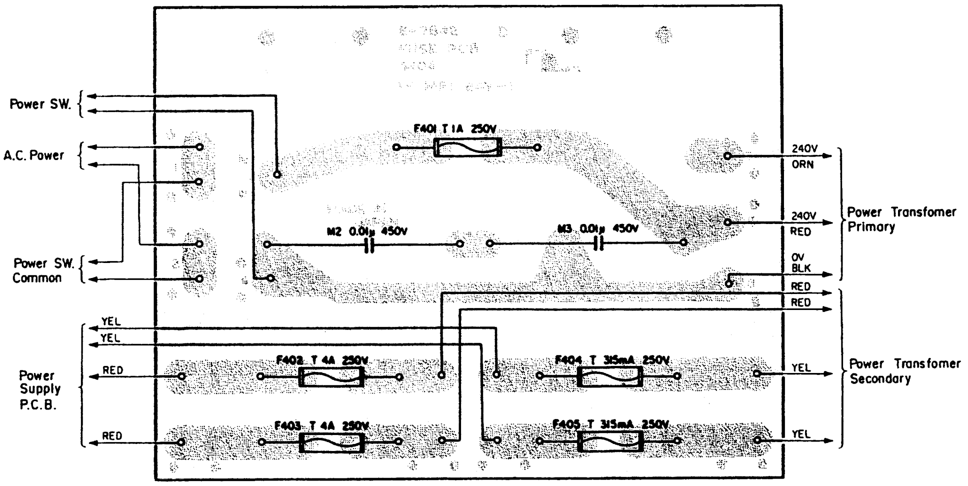

Power SW.
A.C. Power
Power SW. Common
Power Supply P.C.B.
YEL
YEL
RED
RED
F401 T 1A 250V
M2 0.01μ 450V
M3 0.01μ 450V
F402 T 4A 250V
F403 T 4A 250V
F404 T 315mA 250V
F405 T 315mA 250V
240V ORN
240V RED
0V BLK
RED
RED
YEL
YEL
Power Transfomer Primary
Power Transfomer Secondary

Fig. 7.1.4 220 V Class 2

Schematic Ref. No.	Part No.	Description		Schematic Ref. No.	Part No.	Description	
	BA04258A	**Fuse P.C.B. Ass'y (UK & Australia)**			**BA04259A**	**Fuse P.C.B. Ass'y (220V Class 2)**	
	0B07842D	Fuse P.C.B.			0B07842D	Fuse P.C.B.	
F401	0B08347U	Fuse T 1A 250V		F401	0B08347U	Fuse T 1A 250V	
F402,403	0B08609A	Fuse T 4A 250V		F402,403	0B08609A	Fuse T 4A 250V	
F404,405	0B08263U	Fuse T 315mA 250V		F404,405	0B08263U	Fuse T 315mA 250V	
	0B08240A	Spark Killer	(1 pce.)		0B08445A	Spark Killer	(2 pcs.)
	0M04191A	Fuse Label T 1A 250V	(1 pce.)		0M04191A	Fuse Label T 1A 250V	(1 pce.)
	0M04193A	Fuse Label T 4Ax2	(1 pce.)		0M04193A	Fuse Label T 4Ax2	(1 pce.)
	0M04074B	Fuse Label T 315mAx2	(1 pce.)		0M04074B	Fuse Label T 315mAx2	(1 pce.)
	0B08349A	Fuse Clip	(10 pcs.)		0B08349A	Fuse Clip	(10 pcs.)
	0E00752A	Eyelet 2x3	(6 pcs.)		0E00752A	Eyelet 2x3	(6 pcs.)

7.2. Power Supply P.C.B. Ass'y

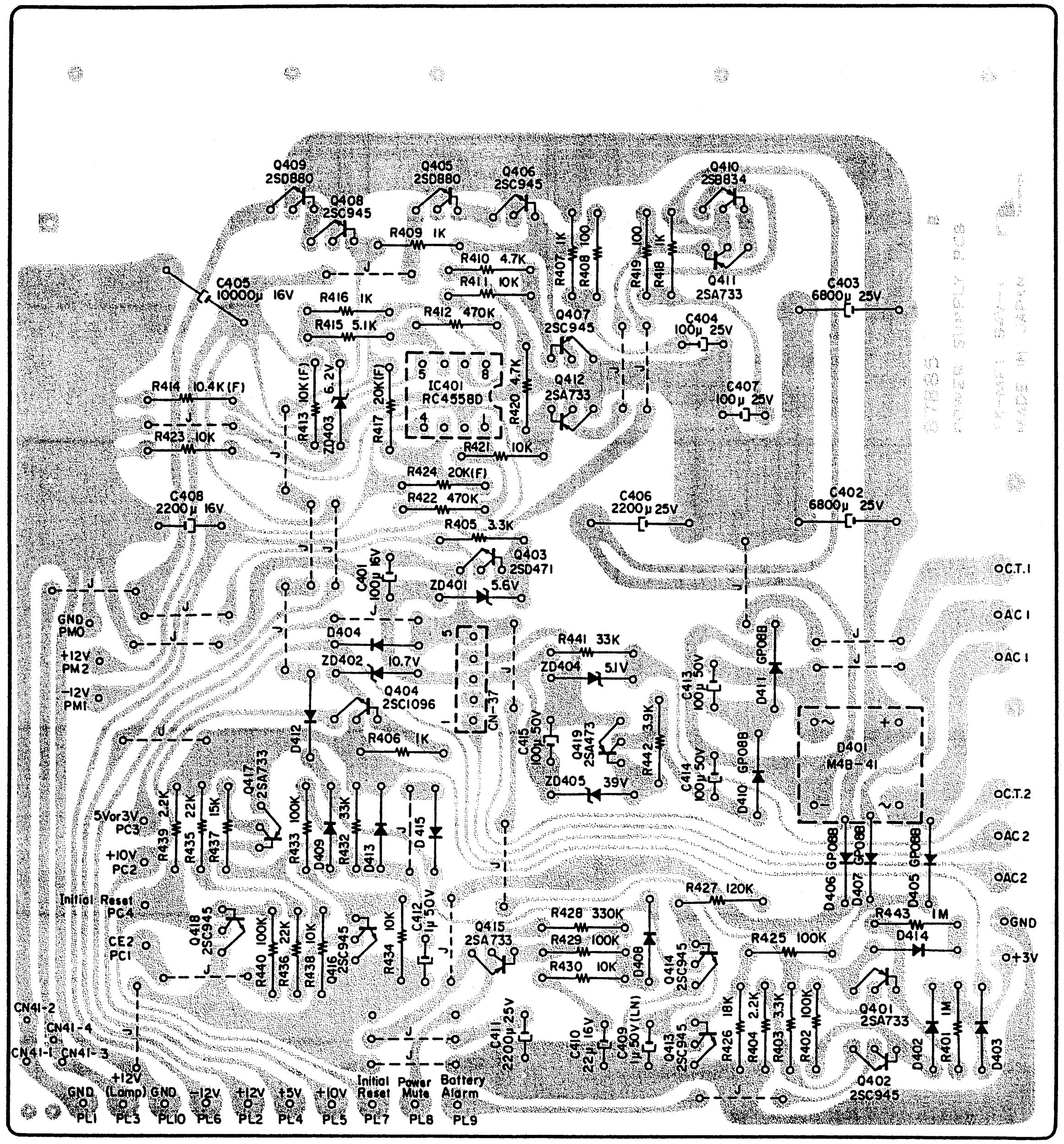

Q409 2SD880
Q405 2SD880
Q406 2SC945
Q410 2SB834
Q408 2SC945
R409 1K
R410 4.7K
R411 10K
R407 1K
R408 100
R419 100
R418 1K
Q411 2SA733
C405 10000µ 16V
R416 1K
R415 5.1K
R412 470K
Q407 2SC945
C404 100µ 25V
C403 6800µ 25V
R414 10.4K(F)
R413 10K(F)
ZD403 6.2V
R417 20K(F)
IC401 RC4558D
R420 4.7K
Q412 2SA733
C407 100µ 25V
R423 10K
R421 10K
R424 20K(F)
R422 470K
C408 2200µ 16V
C406 2200µ 25V
C402 6800µ 25V
R405 3.3K
Q403 2SD471
C401 100µ 16V
ZD401 5.6V
D404
ZD402 10.7V
Q404 2SC1096
R441 33K
ZD404 5.1V
C413 100µ 50V
D411 GP08B
D401 M4B-41
GND PM0
+12V PM2
-12V PM1
O.C.T.1
AC1
AC1
D412
R406 1K
Q417 2SA733
CN-37
C415 100µ 50V
Q419 2SA473
R442 3.9K
ZD405 39V
C414 100µ 50V
D410 GP08B
O.C.T.2
AC2
AC2
5Vor3V PC3
+10V PC2
R439 2.2K
R435 22K
R437 15K
R433 100K
D409
R432 33K
D413
D415
D406 GP08B
D407 GP08B
D405 GP08B
Initial Reset PC4
CE2 PC1
Q418 2SC945
R440 100K
R436 22K
R438 10K
Q416 2SC945
R434 10K
C412 1µ 50V
Q415 2SA733
R428 330K
R429 100K
R430 10K
D408
R427 120K
R425 100K
R443 1M
D414
GND
+3V
Q414 2SC945
CN41-2
CN41-4
CN41-1
CN41-3
C411 2200µ 25V
C410 22µ 16V
C409 1µ 50V (LN)
Q413 2SC945
R426 18K
R404 2.2K
R403 3.3K
R402 100K
Q401 2SA733
D402
R401 1M
D403
Q402 2SC945
+12V (Lamp)
GND
GND
-12V
+12V
+5V
+10V
Initial Reset
Power Mute
Battery Alarm
PL1
PL3
PL10
PL6
PL2
PL4
PL5
PL7
PL8
PL9
POWER SUPPLY PCB
MADE IN JAPAN

Fig. 7.2

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04234A	Power Supply P.C.B. Ass'y
	0B07885B	Power Supply P.C.B.
IC401	0B06124B	IC RC4558D
Q401,411 412,415 417	0B06013A	Transistor 2SA733
Q402,406 407,408 413,414 416,418	0B06100A	Transistor 2SC945 (A)
Q403	0B06066A	Transistor 2SD471
Q404	0B06020A	Transistor 2SC1096
Q405,409	0B06255A	Transistor 2SD880 (Y)
Q410	0B06256A	Transistor 2SB834 (Y)
Q419	0B06060A	Transistor 2SA473 (Y)
ZD401	0B06268A	Zener Diode 5.6V RD5.6EB3
ZD402	0B06231A	Zener Diode 10.7V RD11EB3
ZD403	0Bo6167A	Zener Diode 6.2V RD6.2EB3
ZD404	0B06230A	Zener Diode 5.1V RD5.1EB3
ZD405	0B06235A	Zener Diode 39V RD39EB3
D401	0B06267A	Diode Bridge M4B-41
D402,403 404,408 409 412-415	0B06181A	Silicon Diode 1SS53 (9 pcs.)
D405,406 407,410 411	0B06109A	Silicon Diode GP08B
R401,443	0B05776A	Carbon Resistor 1M ERD-25T J
R402,425 429,433 440	0B01889A	Carbon Resistor 100K ERD-25T J
R403,405	0B01681A	Carbon Resistor 3.3K ERD-25T J
R404,439	0B05622A	Carbon Resistor 2.2K ERD-25T J
R406,407 409,416 418	0B01857A	Carbon Resistor 1K ERD-25T J
R408,419	0B01679A	Carbon Resistor 100 ERD-25T J
R410,420	0B01846A	Carbon Resistor 4.7K ERD-25T J
R411,421 423,430 434,438	0B01888A	Carbon Resistor 10K ERD-25T J
R412,422	0B01684A	Carbon Resistor 470K ERD-25T J
R413	0B09203A	Metal Film Resistor 10K SN14K2E F
R414	0B09433A	Metal Film Resistor 10.4K SN14K2E F
R415	0B09314A	Carbon Resistor 5.1K ERD-25T J
R417,424	0B09439A	Metal Film Resistor 20K SN14K2E F
R426	0B05560A	Carbon Resistor 18K ERD-25T J
R427	0B05621A	Carbon Resistor 120K ERD-25T J
R428	0B05627A	Carbon Resistor 330K ERD-25T J
R432,441	0B05509A	Carbon Resistor 33K ERD-25T J
R435,436	0B05615A	Carbon Resistor 22K ERD-25T J
R437	0B01683A	Carbon Resistor 15K ERD-25T J
R442	0B05675A	Carbon Resistor 3.9K ERD-25T J
C401	0B01400A	Electrolytic Capacitor 100µ 16V
C402,403	0B09374A	Electrolytic Capacitor 6800µ 25V
C404,407	0B01272A	Electrolytic Capacitor 100µ 25V
C405	0B09487A	Electrolytic Capacitor 10000µ 16V
C406,411	0B05654A	Electrolytic Capacitor 2200µ 25V
C408	0B01406A	Electrolytic Capacitor 2200µ 16V
C409	0B09223A	Electrolytic Capacitor 1µ 50V (LN)
C410	0B01862A	Electrolytic Capacitor 22µ 16V
C412	0B01405A	Electrolytic Capacitor 1µ 50V
C413,414 415	0B09313A	Electrolytic Capacitor 100µ 50V
CN37	0B08724A	5P-T Post
CN41	0B08743A	4P-H Connector 700mm

7.3. Pin Jack P.C.B. Ass'y

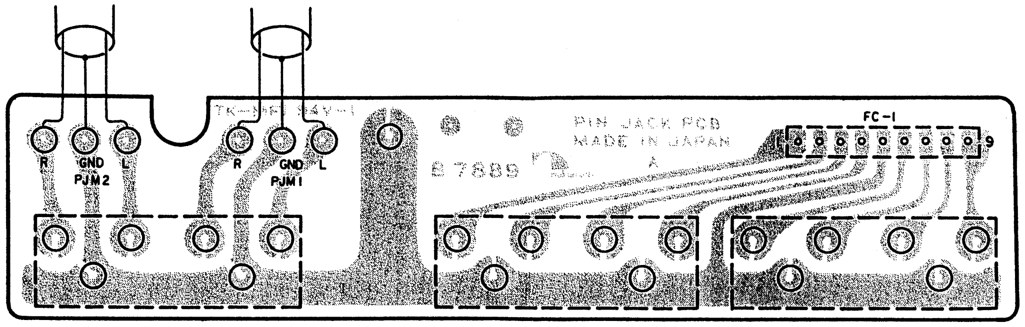

TK-MF1 94V-1
PIN JACK PCB
MADE IN JAPAN
B7889 A
FC-1
9
R
GND
L
PJM2
PJM1

Fig. 7.3

7.4. MIC Jack P.C.B. Ass'y

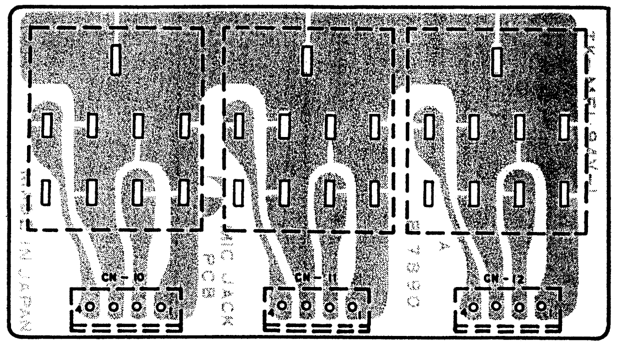

MIC JACK PCB
B7890 A
MADE IN JAPAN
TK-MF1 94V-1
CN-10
CN-11
CN-12

Fig. 7.4

7.5. RAMM Control Switch P.C.B. Ass'y

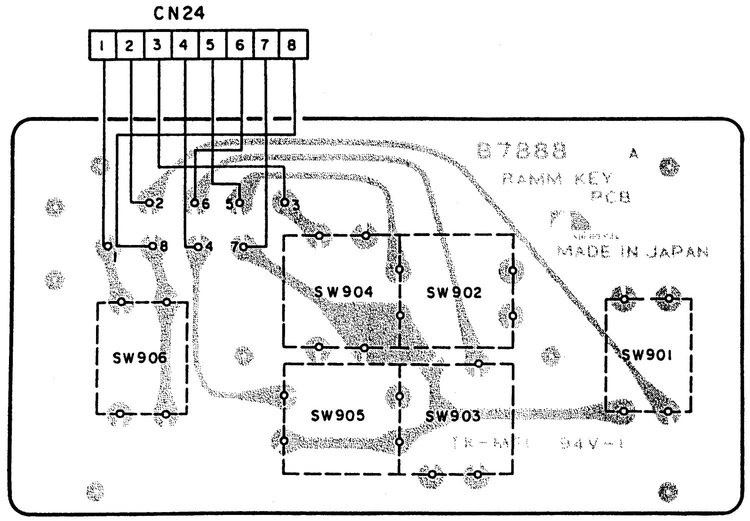

CN24
1
2
3
4
5
6
7
8
B7888 A
RAMM KEY PCB
MADE IN JAPAN
SW904
SW902
SW906
SW901
SW905
SW903
TK-MF1 94V-1

Fig. 7.5

7.6. Function Switch P.C.B. Ass'y

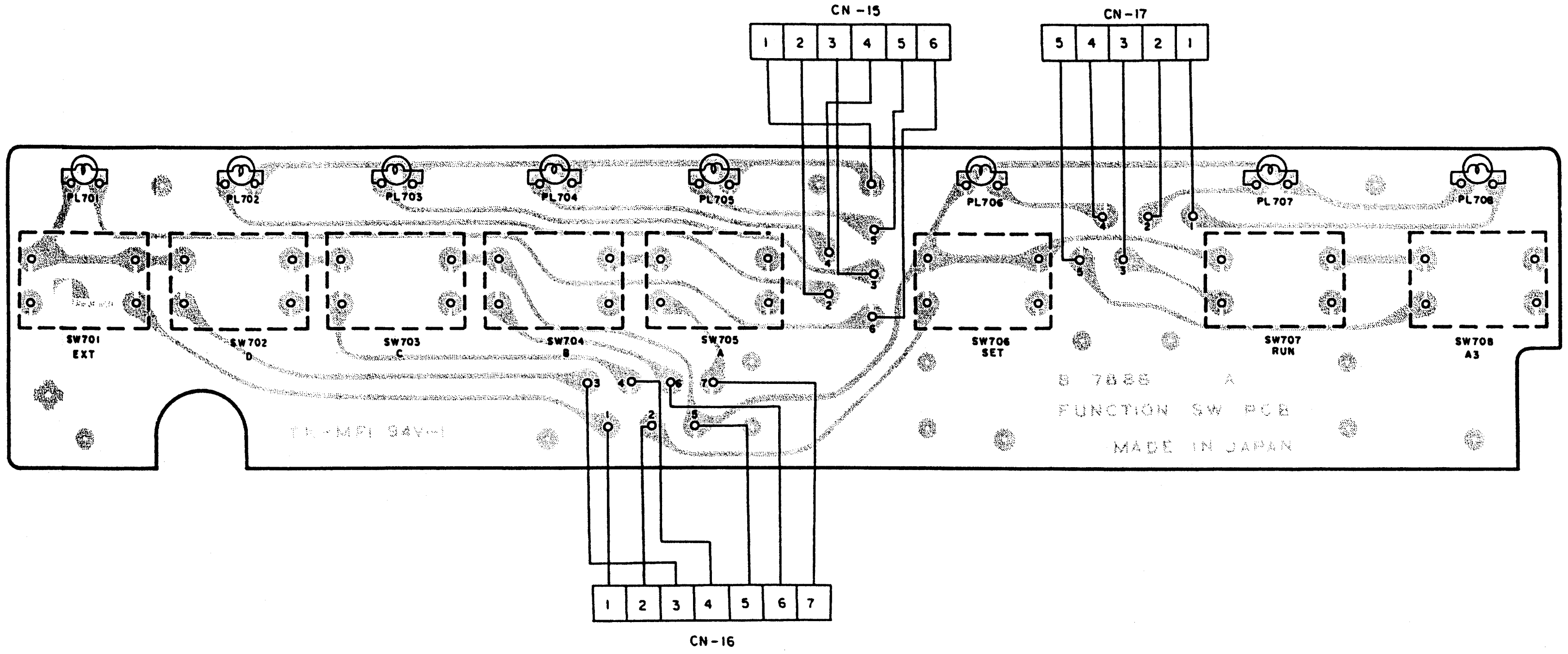

CN-15
CN-17
CN-16
PL701
PL702
PL703
PL704
PL705
PL706
PL707
PL708
SW701 EXT
SW702 D
SW703 C
SW704 B
SW705 A
SW706 SET
SW707 RUN
SW708 A3
B 7886 A
FUNCTION SW PCB
MADE IN JAPAN
TK-MF1 94V-1

Fig. 7.6

7.7. Mechanism Control Switch P.C.B. Ass'y

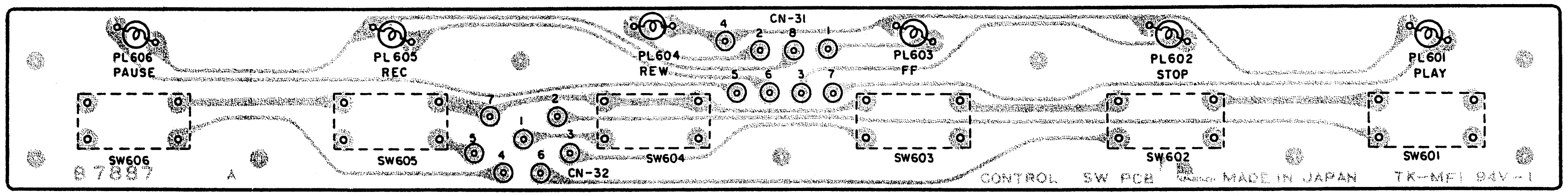

CN-31
CN-32
PL606 PAUSE
PL605 REC
PL604 REW
PL603 FF
PL602 STOP
PL601 PLAY
SW606
SW605
SW604
SW603
SW602
SW601
B 7887 A
CONTROL SW PCB
MADE IN JAPAN
TK-MF1 94V-1

Fig. 7.7

Schematic Ref. No.	Part No.	Description
	BA04242A	**Pin Jack P.C.B. Ass'y**
	0B07889A	Pin Jack P.C.B.
FC1	0B05247A	9P Flat Cable 140mm
	0B08726A	Pin Jack Unit UA-1047 (3 pcs.)
	BA04243A	**MIC Jack P.C.B. Ass'y**
	0B07890A	MIC Jack P.C.B.
CN10,11 12	0B08654A	4P-T Post
	0B08725A	MIC Jack HLJ0259-01-010 (3 pcs.)
	BA04241A	**RAMM Control Switch P.C.B. Ass'y**
	0B07888A	RAMM Control Switch P.C.B.
SW901-906	0B07254A	Push Switch EVQ-PXR04K (6 pcs.)
CN24	0B08752A	8P-H Connector 380mm
	BA04240A	**Function Switch P.C.B. Ass'y**
	0B07886A	Function Switch P.C.B.
PL701-708	0B08721A	Lamp 12V 30mA (8 pcs.)
SW701-708	0B07254A	Push Switch EVQ-PXR04K (8 pcs.)
CN15	0B08750B	6P-H Connector 500mm
CN16	0B08751A	7P-H Connector 630mm
CN17	0B08749A	5P-H Connector 600mm
	BA04239A	**Mechanism Control Switch P.C.B. Ass'y**
	0B07887A	Mechanism Control Switch P.C.B.
PL601-606	0B08722A	Lamp 12V 60mA
SW601-606	0B07254A	Push Switch EVQ-PXR04K
CN31	0B08748A	8P-H Connector 200mm
CN32	0B08747A	7P-H Connector 200mm

7.8. Speed Cal. P.C.B. Ass'y

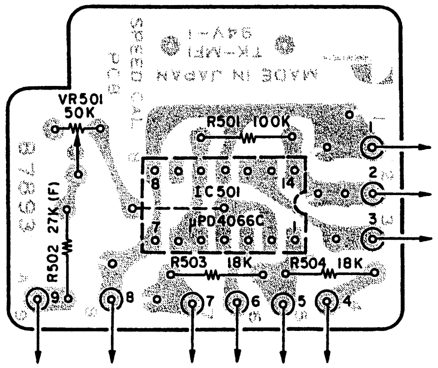

VR501
50K
R501 100K
IC501
µPD4066C
R502 27K (F)
R503 18K
R504 18K
1
2
3
4
5
6
7
8
9
14
7

Fig. 7.8

7.9. Counter Pulse Generator P.C.B. Ass'y

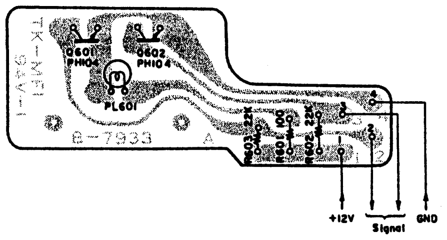

Q601 PH104
Q602 PH104
PL601
+12V
Signal
GND

Fig. 7.9

7.10. Shut-off P.C.B. Ass'y

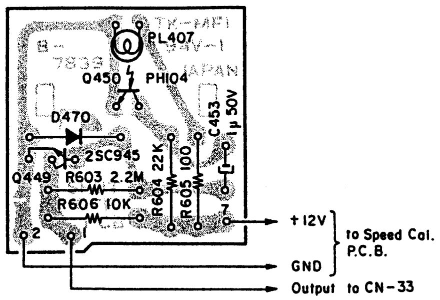

PL407
Q450 PH104
D470
C453 1µ 50V
2SC945
Q449
R603 2.2M
R604 22K
R605 100
R606 10K
+12V
GND
Output
to Speed Cal. P.C.B.
to CN-33

Fig. 7.10

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04238A	**Speed Cal. P.C.B. Ass'y**
	0B07893A	Speed Cal. P.C.B.
IC501	0B06144A	IC µPD4066C
VR501	0B07269A	Semi-fixed Volume 50K
R501	0B01889A	Carbon Resistor 100K ERD-25T J
R502	0B09444A	Metal Film Resistor 27K SN14K2E F
R503,504	0B05560A	Carbon Resistor 18K ERD-25T J
	BA04237B	**Counter Pulse Generator P.C.B. Ass'y**
	0B07933A	Counter Pulse Generator P.C.B.
Q601,602	0B06228A	Photo Transistor PH-104
R601	0B01679A	Carbon Resistor 100 ERD-25T J
R602,603	0B05615A	Carbon Resistor 22K ERD-25T J
PL601	0B08552A	Lamp 12V 25mA
	0C08281B	P.C.B. Holder (1 pce.)
	0E00792A	BT Screw M2.6x6 Philips Pan Head (2 pcs.)
	BA04070A	**Shut-off P.C.B. Ass'y**
	0B07839A	Shut-off P.C.B.
Q449	0B01872A	Transistor 2SC945 (L)
Q450	0B06228A	Photo Transistor PH104
D470	0B06181A	Silicon Diode 1SS53
R603	0B05671A	Carbon Resistor 2.2M ERD-25T J
R604	0B05615A	Carbon Resistor 22K ERD-25T J
R605	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
R606	0B01888A	Carbon Resistor 10K ERD-25T J
C453	0B01405A	Electrolytic Capacitor 1µ 50V
PL407	0B08552A	Lamp 12V 25mA
	BA04245A	**FL Indicator P.C.B. A Ass'y**
	0B07895A	FL Indicator P.C.B. A
IC601	0B06144A	IC µPD4066C
IC602,604 611	0B06219A	IC µPD4081C
IC603,613	0B06178A	IC µPD4011C
IC605	0B06216A	IC µPC4556C
IC606,610	0B06143A	IC µPD4001C
IC607	0B06217A	IC RC4560D
IC608	0B06262A	IC µPD4025C
IC609	0B06214A	IC µPD4071C
IC612,614	0B06244A	IC µPD4073BC
IC615	0B06223A	IC µPD4040C
Q601	0B06013A	Transistor 2SA733
Q602	0B06100A	Transistor 2SC945 (A)
D601-609	0B06181A	Silicon Diode 1SS53 (9 pcs.)
VR601	0B07270A	Semi-fixed Volume 20K
R601,605 607,611 612,615 616,629 630	0B01888A	Carbon Resistor 10K ERD-25T J
R602,603 631	0B05641A	Carbon Resistor 47K ERD-25T J
R604,622	0B01889A	Carbon Resistor 100K ERD-25T J
R608,609 610,621 623,624 625,626 627,628	0B05615A	Carbon Resistor 22K ERD-25T J
R613	0B09463A	Metal Film Resistor 110K SN14K2E F
R614	0B09203A	Metal Film Resistor 10K SN14K2E F
R617	0B01857A	Carbon Resistor 1K ERD-25T J
R618	0B09525A	Metal Film Resistor 70.6K SN14K2E F
R619	0B09524A	Metal Film Resistor 60.4K SN14K2E F
R620	0B09523A	Metal Film Resistor 13.7K SN14K2E F
C601	0B09414A	PP Capacitor 560P 100V G
C602	0B05657A	Tantalum Capacitor 4.7µ 16V
C603	0B09290A	Ceramic Capacitor 0.01µ 50V Z
C604	0B09191A	PP Capacitor 4700P 100V G
C605	0B09285A	Ceramic Capacitor 330P 50V K
CN21	0B08744A	7P-H Connector Ass'y 200mm
CN38	0B08734A	6P-T Connector F6P-HVQ
CN39	0B08735A	11P-T Connector F11P-HVQ
CN40	0B08733A	5P-T Connector F5P-HVQ

7.11. FL Indicator P.C.B. A Ass'y

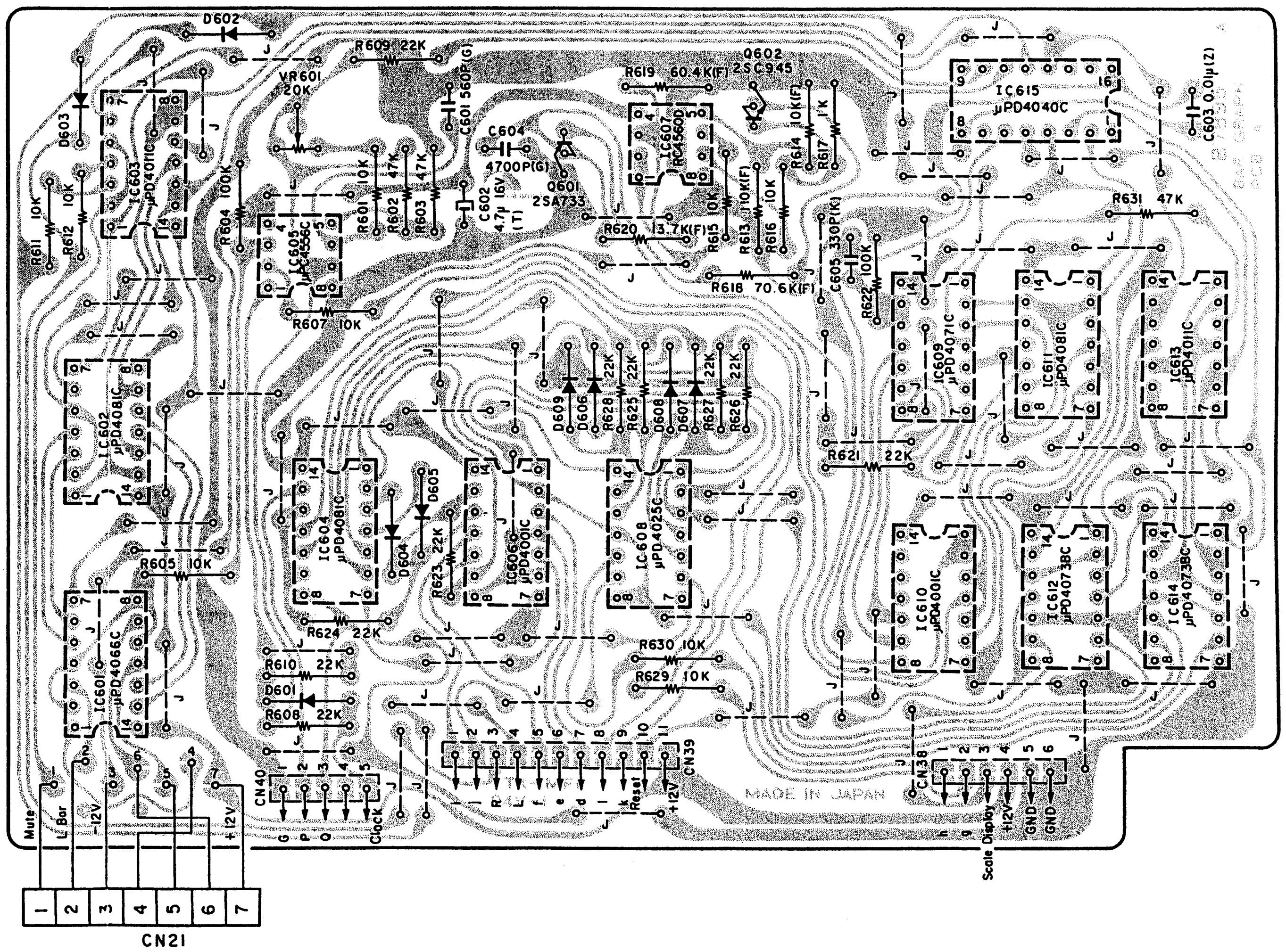

D602
R609 22K
VR601 20K
Q602 2SC945
R619 60.4K(F)
IC615 µPD4040C
C603 0.01µ(Z)
D603
IC603 µPD4011C
C601 560P(G)
C604 4700P(G)
IC607 RC4560D
R614 10K(F)
R617 1K
C602 4.7µ 16V (T)
Q601 2SA733
R611 10K
R612 10K
R604 100K
IC605 µPC4556C
R601 10K
R602 47K
R603 47K
R620 13.7K(F)
R615
R613 110K(F)
R616 10K
R618 70.6K(F)
C605 330P(K)
R622 100K
R631 47K
R607 10K
IC602 µPD4081C
D609
D606
R628 22K
R625 22K
D608
D607
R627 22K
R626 22K
IC609 µPD4071C
IC611 µPD4081C
IC613 µPD4011C
R621 22K
IC604 µPD4081C
D604
D605
R623 22K
IC606 µPD4001C
IC608 µPD4025C
IC610 µPD4001C
IC612 µPD4073BC
IC614 µPD4073BC
R605 10K
R624 22K
R630 10K
R629 10K
IC601 µPD4066C
R610 22K
D601
R608 22K
CN40
CN39
CN38
Reset
Clock
MADE IN JAPAN
Mute
L Bar
+12V
GND
Scale Display
CN21
1
2
3
4
5
6
7

Fig. 7.11

Note: Diode is 1SS53 unless otherwise specified.

7.12. FL Indicator P.C.B. B Ass'y

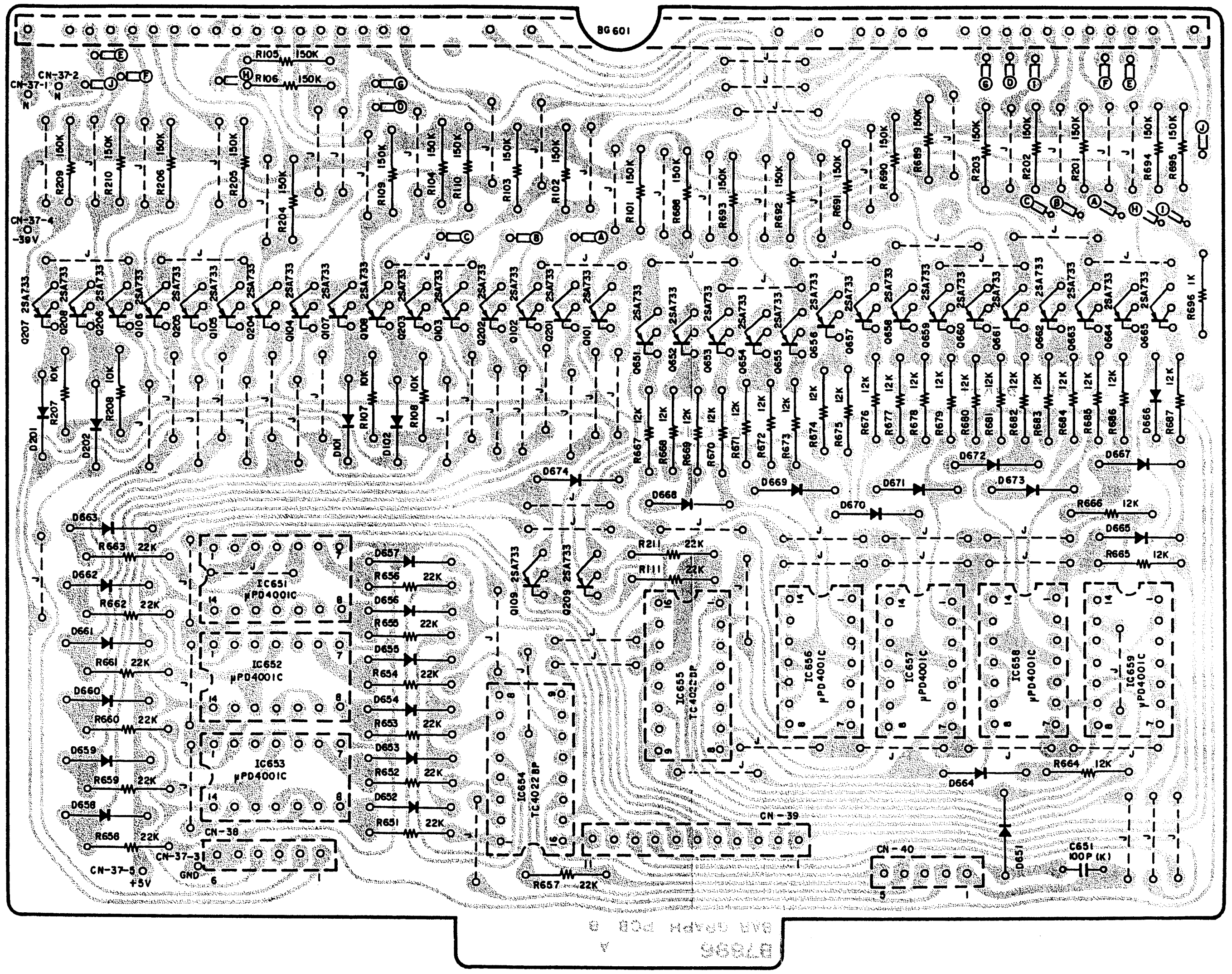

BG601
CN-37-1
CN-37-2
CN-37-4 -38V
CN-37-5 +5V
CN-37-3 GND
CN-38
CN-39
CN-40
IC651 μPD4001C
IC652 μPD4001C
IC653 μPD4001C
IC654 TC4022BP
IC655 TC4022BP
IC656 μPD4001C
IC657 μPD4001C
IC658 μPD4001C
IC659 μPD4001C
C651 100P (K)
R105 150K
R106 150K
R696 1K
R657 22K
R664 12K
R665 12K
R666 12K
R211 22K
R111 22K
D664
D665
D666
D667
D668
D669
D670
D671
D672
D673
D674
2SA733

Fig. 7.12 Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04246A	FL Indicator P.C.B. B Ass'y
	0B07896A	FL Indicator P.C.B. B
IC651-653 656-659	0B06143A	IC μPD4001C (7 pcs.)
IC654,655	0B06218A	IC TC4022BP
Q101-109 201-209 651-665	0B06013A	Transistor 2SA733 (33 pcs.)
D101,102 201,202 651-674	0B06181A	Silicon Diode 1SS53 (28 pcs.)
R101-106 109,110 201-206 209,210 688-695	0B05626A	Carbon Resistor 150K ERD-25T J (24 pcs.)
R107,108 207,208	0B01888A	Carbon Resistor 10K ERD-25T J
R111,211 651-663	0B05615A	Carbon Resistor 22K ERD-25T J (15 pcs.)
R664-687	0B09263A	Carbon Resistor 12K ERD-25T J (24 pcs.)
R696	0B01857A	Carbon Resistor 1K ERD-25T J
C651	0B09282A	Ceramic Capacitor 100P 50V K
BG601	0B08717A	FL Indicator FIP58BW18Y
CN37	0B08745A	5P-H Connector
CN38	0B08182A	6P-T Post
CN39	0B08253A	11P-T Post
CN40	0B08183A	5P-T Post

7.13. Detector P.C.B. Ass'y

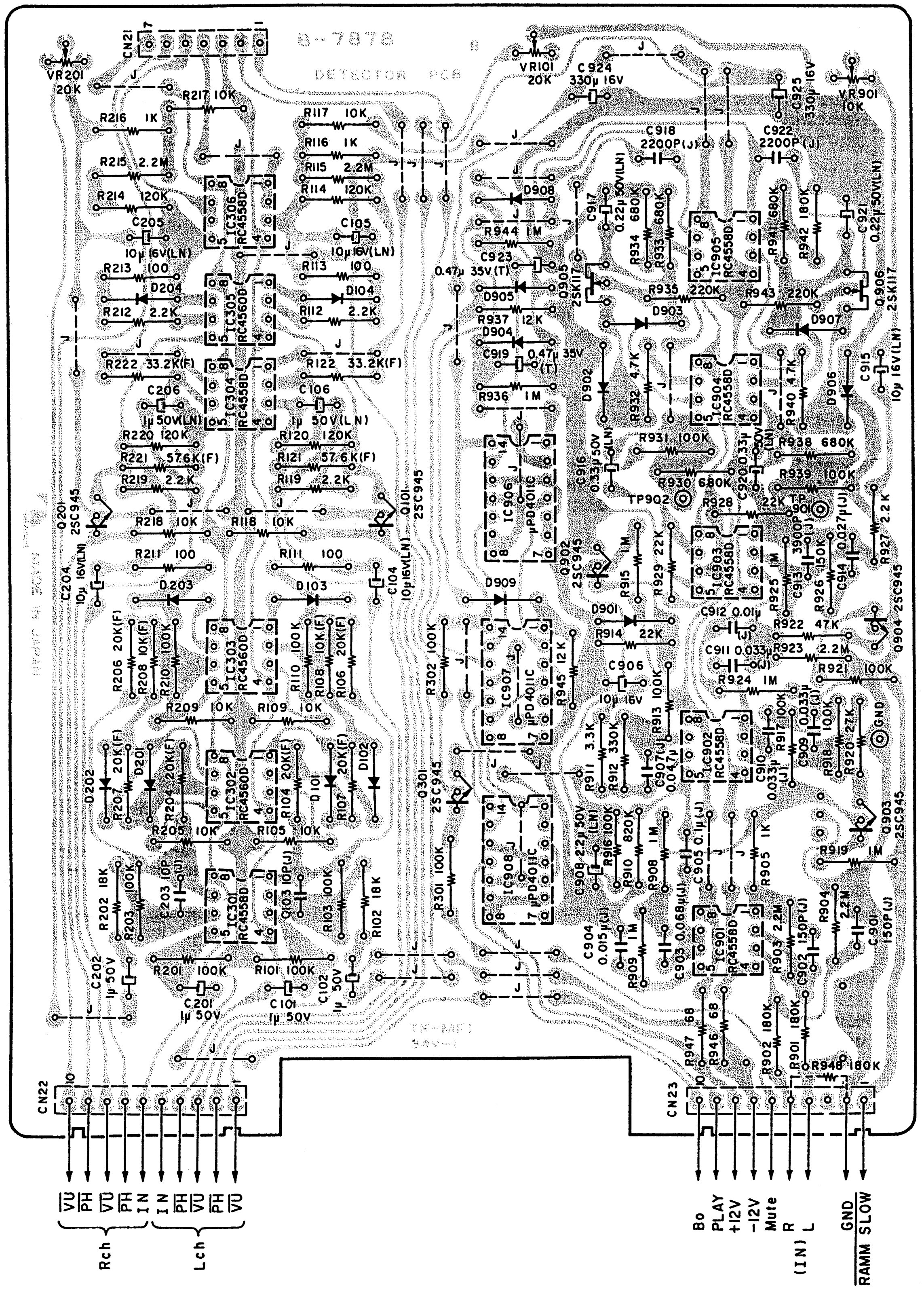

DETECTOR PCB
B-7878
CN21
CN22
CN23
VR201 20K
VR101 20K
VR901 10K
IC301 RC4558D
IC302 RC4560D
IC303 RC4560D
IC304 RC4558D
IC305 RC4560D
IC306 RC4558D
IC901 RC4558D
IC902 RC4558D
IC903 RC4558D
IC904 RC4558D
IC905 RC4558D
IC906 μPD4011C
IC907 μPD4011C
IC908 μPD4011C
Q101 2SC945
Q201 2SC945
Q301 2SC945
Q902 2SC945
Q903 2SC945
Q904 2SC945
Q905 2SK117
Q906 2SK117
TP902
TP901
GND
VU
PH
VU
PH
IN
IN
PH
VU
PH
VU
Rch
Lch
Bo
PLAY
+12V
−12V
Mute
R
(IN) L
GND
RAMM SLOW

Fig. 7.13 Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04230A	Detector P.C.B. Ass'y
	0B07878B	Detector P.C.B.
IC301,304 306,901 902,903 904,905	0B06124B	IC RC4558D
IC302,303 305	0B06217A	IC RC4560D
IC906,907 908	0B06178A	IC μPD4011C
Q101,201 301,902 903,904	0B06100A	Transistor 2SC945 (A)
Q905,906	0B06129A	FET 2SK117 (Y)
D101-104 201-204 901-909	0B06181A	Silicon Diode 1SS53 (17 pcs.)
VR101,201	0B07215A	Semi-fixed Volume 20K
VR901	0B07162A	Semi-fixed Volume 10K
R101,103 110,201 203,210 301,302 913,916 917,918 921,931 939	0B01889A	Carbon Resistor 100K ERD-25T J
R102,202	0B05560A	Carbon Resistor 18K ERD-25T J
R104,106 107,204 206,207	0B09439A	Metal Film Resistor 20K SN14K2E F
R105,109 117,118 205,209 217,218	0B01888A	Carbon Resistor 10K ERD-25T J
R108,208	0B09203A	Metal Film Resistor 10K SN14K2E F
R111,113 211,213	0B01679A	Carbon Resistor 100 ERD-25T J
R112,119 212,219 927	0B05622A	Carbon Resistor 2.2K ERD-25T J
R114,120 214,220	0B05621A	Carbon Resistor 120K ERD-25T J
R115,215 903,904 923	0B05671A	Carbon Resistor 2.2M ERD-25T J
R116,216 905	0B01857A	Carbon Resistor 1K ERD-25T J
R121,221	0B09454A	Metal Film Resistor 57.6K SN14K2E F
R122,222	0B09446A	Metal Film Resistor 33.2K SN14K2E F
R901,902 942,948	0B05640A	Carbon Resistor 180K ERD-25T J
R908,909 915,919 924,925 936,944	0B05776A	Carbon Resistor 1M ERD-25T J
R910	0B09320A	Carbon Resistor 820K ERD-25T J
R911	0B01681A	Carbon Resistor 3.3K ERD-25T J
R912	0B05627A	Carbon Resistor 330K ERD-25T J
R914,928 929	0B05615A	Carbon Resistor 22K ERD-25T J
R920	0B05743A	Carbon Resistor 27K ERD-25T J
R922	0B05641A	Carbon Resistor 47K ERD-25T J
R926	0B05626A	Carbon Resistor 150K ERD-25T J
R930,933 934,938 941	0B09335A	Carbon Resistor 680K ERD-25T J
R932,940	0B01846A	Carbon Resistor 4.7K ERD-25T J
R935,943	0B05625A	Carbon Resistor 220K ERD-25T J
R937,945	0B09263A	Carbon Resistor 12K ERD-25T J
R946,947	0B09306A	Fail Safe Type Resistor 68 RDF-25S J
C101,102 201,202	0B01405A	Electrolytic Capacitor 1μ 50V
C103,203	0B09277A	Ceramic Capacitor 10P 50V J
C104,105 204,205 915	0B09148A	Electrolytic Capacitor 10μ 16V (LN)
C106,206	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C901,902	0B09281A	Ceramic Capacitor 150P 50V J
C903	0B05682A	Mylar Capacitor 0.068μ 50V J
C904	0B05557A	Mylar Capacitor 0.015μ 50V J
C905	0B01780A	Mylar Capacitor 0.1μ 50V J
C906	0B01412A	Electrolytic Capacitor 10μ 16V
C907	0B05796A	Mylar Capacitor 0.047μ 50V J
C908	0B09332A	Electrolytic Capacitor 2.2μ 50V (LN)
C909,910 911	0B05583A	Mylar Capacitor 0.033μ 50V J
C912	0B05681A	Mylar Capacitor 0.01μ 50V J
C913	0B01804A	Mylar Capacitor 3900P 50V J
C914	0B09045A	Mylar Capacitor 0.027μ 50V J
C916,920	0B09327A	Electrolytic Capacitor 0.33μ 50V (LN)
C917,921	0B09144A	Electrolytic Capacitor 0.22μ 50V (LN)
C918,922	0B01802A	Mylar Capacitor 2200P 50V J
C919,923	0B05792A	Tantalum Capacitor 0.47μ 35V
C924,925	0B01502A	Electrolytic Capacitor 330μ 16V
CN21	0B08643A	7P-T Post
CN22,23	0B08731A	10P-S Connector F10P-SHVQ

7.14. Record Dolby NR P.C.B. Ass'y

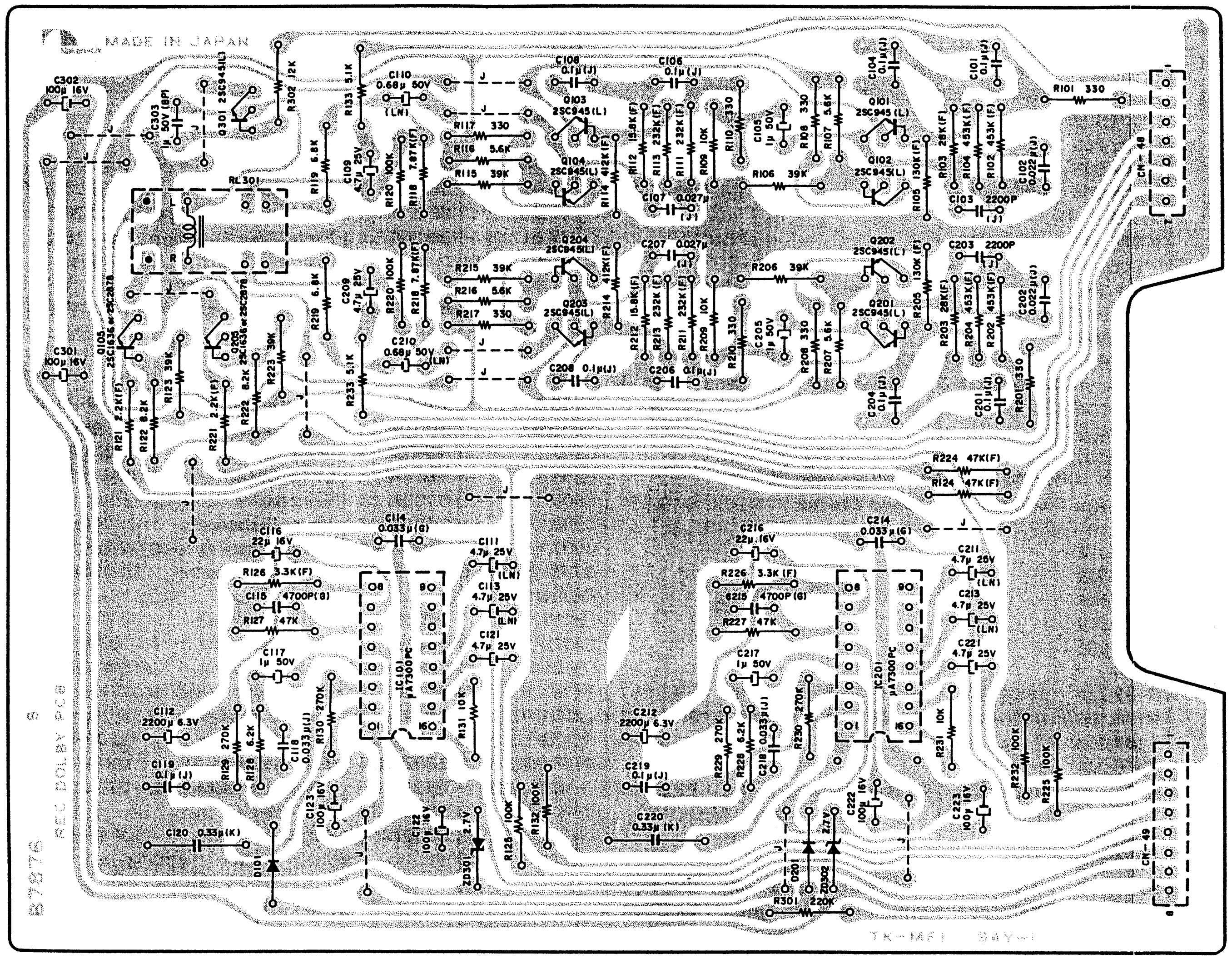


Fig. 7.14 Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04236A	**Record Dolby NR P.C.B. Ass'y**
	0B07876B	Record Dolby NR P.C.B.
IC101,201	0B06200A	IC μA7300PC
Q101,102 103,104 201,202 203,204 301	0B01872A	Transistor 2SC945 (L)
Q105,205	0B06070A (0B06299A)	Transistor 2SC1636 (2SC2878)
ZD301,302	0B06191A	Zener Diode 2.7V 2.7EB
D101,201	0B01909A	Silicon Diode 1S1555
R101,108 110,117 201,208 210,217	0B05577A	Carbon Resistor 330 ERD-25T J
R102,104 202,204	0B09480A	Metal Film Resistor 453K SN14K2E F
R103,203	0B09445A	Metal Film Resistor 28K SN14K2E F
R105,205	0B09466A	Metal Film Resistor 130K SN14K2E F
R106,115 123,206 215,223	0B01854A	Carbon Resistor 39K ERD-25T J
R107,116 207,216	0B01887A	Carbon Resistor 5.6K ERD-25T J
R109,131 209,231	0B01888A	Carbon Resistor 10K ERD-25T J
R111,113 211,213	0B09473A	Metal Film Resistor 232K SN14K2E F
R112,212	0B09437A	Metal Film Resistor 15.8K SN14K2E F
R114,214	0B09478A	Metal Film Resistor 412K SN14K2E F
R118,218	0B09430A	Metal Film Resistor 7.87K SN14K2E F
R119,219	0B01682A	Carbon Resistor 6.8K ERD-25T J
R120,125 132,220 225,232	0B01889A	Carbon Resistor 100K ERD-25T J
R121,221	0B09420A	Metal Film Resistor 2.2K SN14K2E F
R122,222	0B01856A	Carbon Resistor 8.2K ERD-25T J
R124,224	0B09451A	Metal Film Resistor 47K SN14K2E F
R126,226	0B09317A	Metal Film Resistor 3.3K SN14K2E F
R127,227	0B05641A	Carbon Resistor 47K ERD-25T J
R128,228	0B09271A	Carbon Resistor 6.2K ERD-25T J
R129,130 229,230	0B05620A	Carbon Resistor 270K ERD-25T J
R133,233	0B09314A	Carbon Resistor 5.1K ERD-25T J
R301	0B05625A	Carbon Resistor 220K ERD-25T J
R302	0B09263A	Carbon Resistor 12K ERD-25T J
C101,104 106,108 119,201 204,206 208,219	0B01780A	Mylar Capacitor 0.1μ 50V J
C102,202	0B05582A	Mylar Capacitor 0.022μ 50V J
C103,203	0B01802A	Mylar Capacitor 2200P 50V J
C105,117 205,217	0B01405A	Electrolytic Capacitor 1μ 50V
C107,207	0B09045A	Mylar Capacitor 0.027μ 50V J
C109,121 209,221	0B01402A	Electrolytic Capacitor 4.7μ 25V
C110,210	0B09395A	Electrolytic Capacitor 0.68μ 50V (LN)
C111,113 211,213	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)
C112,212	0B09257A	Electrolytic Capacitor 2200μ 6.3V
C114,214	0B09240A	PP Capacitor 0.033μ 50V G
C115,215	0B09191A	PP Capacitor 4700P 50V G
C116,216	0B01862A	Electrolytic Capacitor 22μ 16V
C118,218	0B05583A	Mylar Capacitor 0.033μ 50V J
C120,220	0B09399A	Mylar Capacitor 0.33μ 100V K
C122,123 222,223 301,302	0B01400A	Electrolytic Capacitor 100μ 16V
C303	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
RL301	0B07326A	FBR Relay 12V
CN48	0B08729A	7P-S Connector F7P-SHVQ
CN49	0B08730A	8P-S Connector F8P-SHVQ
	0B08714A	IC Socket 16P (2 pcs.)
	BA04231A	**Record Eq. Amp. P.C.B. Ass'y**
	0B07877A	Record Eq. Amp. P.C.B.
IC101,102 201,202 304,305	0B06144A	IC μPD4066C
IC103,203 306,307	0B06261A	IC μPD4508BC
IC301,302	0B06146A	IC RC4558DD
IC303	0B06287A	IC RC4558DD MC
Q101,102 103,104 201,202 203,204	0B01872A	Transistor 2SC945 (L)
Q105,205	0B06013A	Transistor 2SA733
L101,201	0B00068A	Trap Coil 10.5mH
R101,121 201,221	0B05560A	Carbon Resistor 18K ERD-25T J
R102,202	0B05621A	Carbon Resistor 120K ERD-25T J
R103,203	0B09442A	Metal Film Resistor 22.3K SN14K2E F
R104,204	0B09229A	Metal Film Resistor 18K SN14K2E F
R105,205	0B09464A	Metal Film Resistor 121K SN14K2E F
R106,206	0B09454A	Metal Film Resistor 57.6K SN14K2E F
R107,207	0B09443A	Metal Film Resistor 26.4K SN14K2E F
R108,111 114,142 208,211 214,242	0B05508A	Carbon Resistor 56K ERD-25T J
R109,112 115,119 143,209 212,215 219,243	0B05626A	Carbon Resistor 150K ERD-25T J
R110,113 116,144 145,210 213,216 244,245	0B01854A	Carbon Resistor 39K ERD-25T J
R117,217	0B09428A	Metal Film Resistor 5.76K SN14K2E F
R118,218	0B05577A	Carbon Resistor 330 ERD-25T J
R120,220	0B05743A	Carbon Resistor 27K ERD-25T J
R122,131 222,231	0B09203A	Metal Film Resistor 10K SN14K2E F
R123,223	0B05620A	Carbon Resistor 270K ERD-25T J

Schematic Ref. No.	Part No.	Description
R124,224	0B09466A	Metal Film Resistor 130K SN14K2E F
R125,225	0B09298A	Metal Film Resistor 64.9K SN14K2E F
R126,226	0B09446A	Metal Film Resistor 33.2K SN14K2E F
R127,227	0B09438A	Metal Film Resistor 16.5K SN14K2E F
R128,228	0B09431A	Metal Film Resistor 8.06K SN14K2E F
R129,229	0B09423A	Metal Film Resistor 4.02K SN14K2E F
R130,230	0B09419A	Metal Film Resistor 2K SN14K2E F
R132,232	0B09436A	Metal Film Resistor 14K SN14K2E F
R133,233	0B09335A	Carbon Resistor 680K ERD-25T J
R134,234	0B09380A	Carbon Resistor 1.5M ERD-25T J
R135,235	0B05962A	Carbon Resistor 1.2M ERD-25T J
R136,236	0B09357A	Metal Film Resistor 33K SN14K2E F
R137,237	0B09391A	Carbon Resistor 91K ERD-25T J
R138,238	0B05675A	Carbon Resistor 3.9K ERD-25T J
R139,239	0B05974A	Carbon Resistor 680 ERD-25T J
R140,240	0B05641A	Carbon Resistor 47K ERD-25T J
R141,241	0B05622A	Carbon Resistor 2.2K ERD-25T J
R146,246	0B05627A	Carbon Resistor 330K ERD-25T J
R147-154 247-254 303-310	0B05625A	Carbon Resistor 220K ERD-25T J (24 pcs.)
R301,302	0B09049A	Fail Safe Type Resistor 22 ERD-14F J
C101,201	0B09045A	Mylar Capacitor 0.027µ 50V J
C102,202	0B09223A	Electrolytic Capacitor 1µ 50V (LN)
C103,119 203,219	0B09403A	PP Capacitor 620P 100V J
C104,204	0B05687A	Mylar Capacitor 1200P 50V J
C105,205	0B01802A	Mylar Capacitor 2200P 50V J
C106,206	0B05636A	Tantalum Capacitor 22µ 16V
C107,207	0B09247A	Mica Capacitor 220P 50V J
C108,110 208,210	0B09488A	Ceramic Capacitor 30P 50V J
C109,209	0B09484A	PP Capacitor 470P 100V G
C111,211	0B09408A	PP Capacitor 1000P 100V G
C112,212	0B09485A	PP Capacitor 680P 100V G
C113,213	0B09486A	Mica Capacitor 120P 50V J
C114,214	0B09397A	Electrolytic Capacitor 470µ 10V (LN)
C115,215	0B09412A	PP Capacitor 0.011µ 100V G
C116,216	0B09094A	Tantalum Capacitor 1µ 50V
C117,217	0B09375A	Electrolytic Capacitor 47µ 10V (LN)
C118,218	0B05909A	Mylar Capacitor 0.12µ 50V J
C120,220	0B09189A	Mylar Capacitor 2700P 50V J
C121,221	0B01913A	Mylar Capacitor 1800P 50V J
C301,302	0B01502A	Electrolytic Capacitor 330µ 16V
CN45,46	0B08727A	5P-S Connector F5P-SHVQ
CN51	0B08644A	8P-T Post
CN52	0B08654A	4P-T Post

7.15. Record Eq. Amp. P.C.B. Ass'y

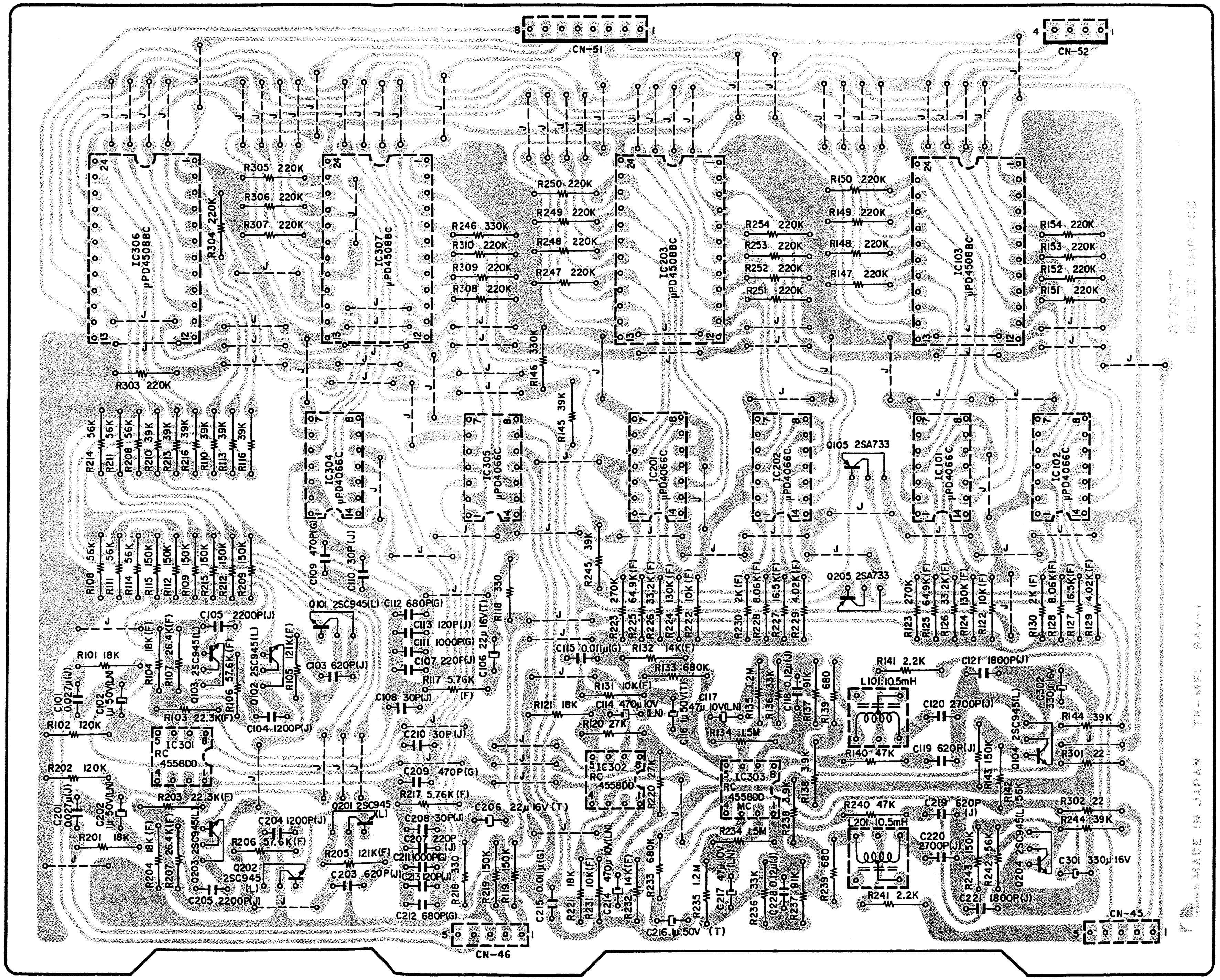

CN-51
CN-52
CN-45
CN-46
IC306 µPD4508BC
IC307 µPD4508BC
IC203 µPD4508BC
IC103 µPD4508BC
IC304 µPD4066C
IC305 µPD4066C
IC201 µPD4066C
IC202 µPD4066C
IC101 µPD4066C
IC102 µPD4066C
IC301 RC 4558DD
IC302 RC 4558DD
IC303 RC 4558DD
Q105 2SA733
Q205 2SA733
Q101 2SC945(L)
Q102 2SC945(L)
Q103 2SC945(L)
Q104 2SC945(L)
Q201 2SC945(L)
Q202 2SC945(L)
Q203 2SC945(L)
Q204 2SC945(L)
L101 10.5mH
L201 10.5mH
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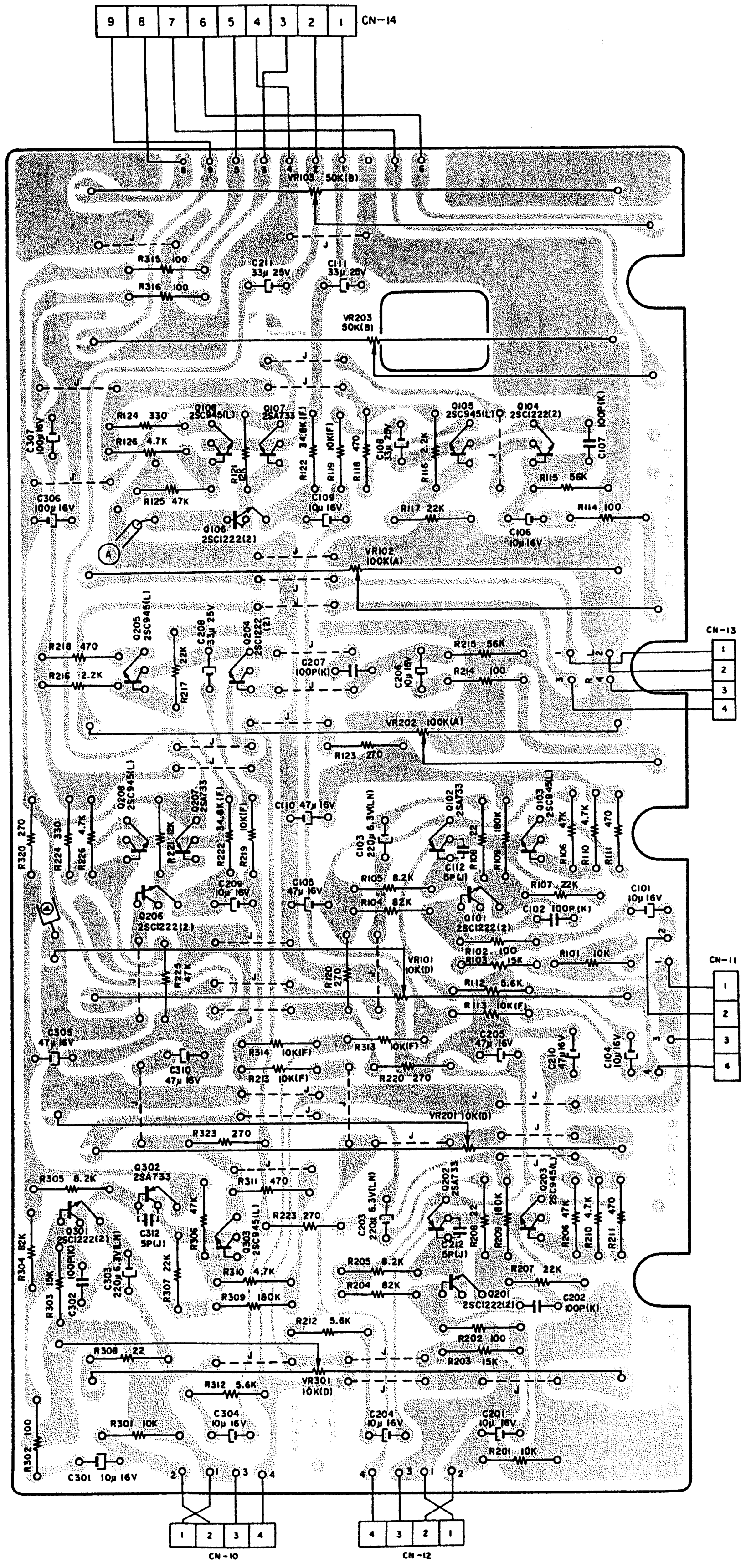
Fig. 7.15

Note: Diode is 1SS53 unless otherwise specified.

7.16. MIC Amp. and Volume P.C.B. Ass'y



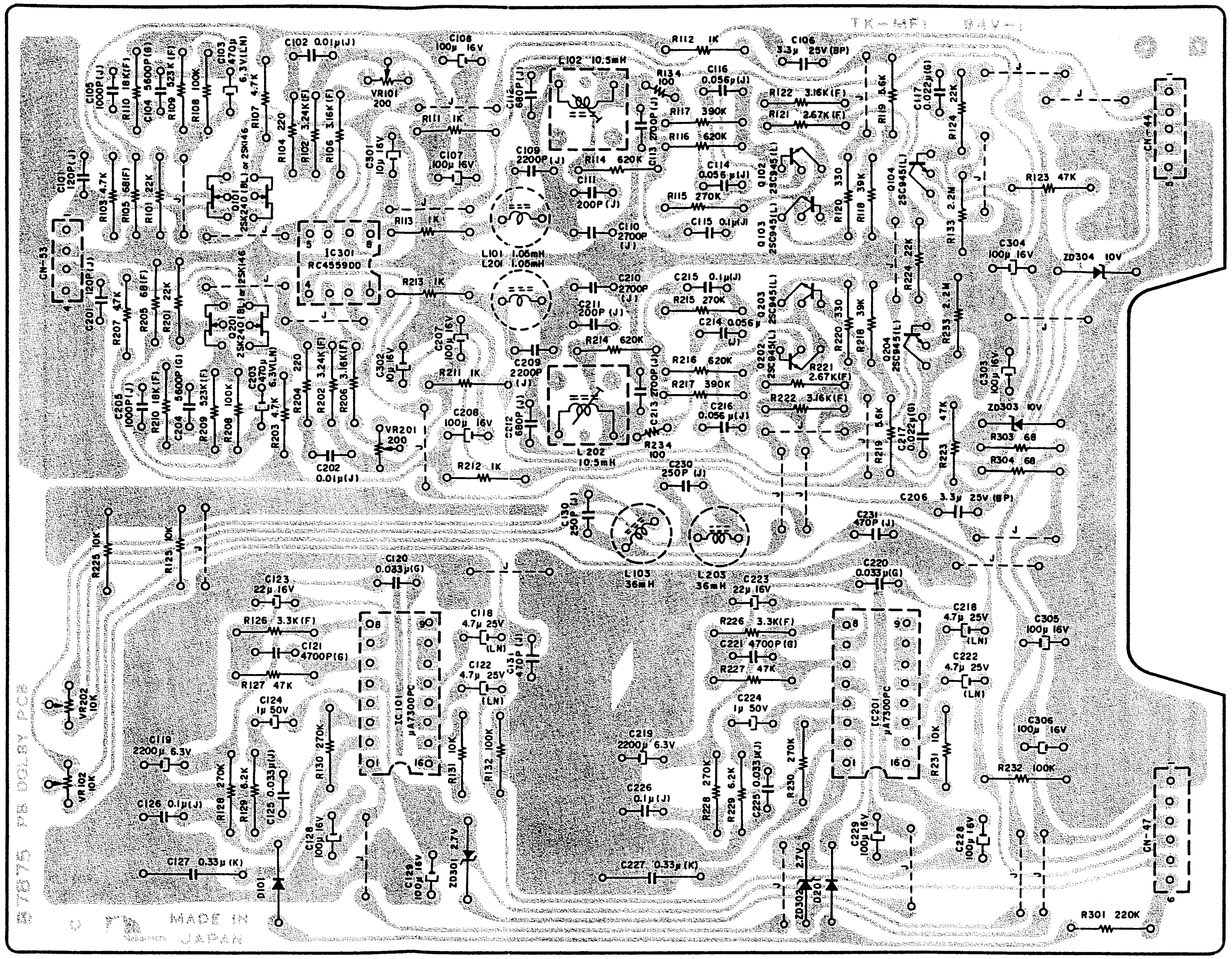
Note: Diode is 1SS53 unless otherwise specified.

Fig. 7.16

Schematic Ref. No.	Part No.	Description
	BA04232A	**MIC Amp. and Volume P.C.B. Ass'y**
	0B07884B	MIC Amp. and Volume P.C.B.
Q101,104 106,201 204,206 301	0B06062A	Transistor 2SC1222 (2)
Q102,107 202,207 302	0B06013A	Transistor 2SA733
Q103,105 108,203 205,208 303	0B01872A	Transistor 2SC945 (L)
VR101,201 301	0B07331A	Slide Volume 10K (D)
VR102,202	0B07332A	Slide Volume 100K (A)
VR103,203	0B07333A	Slide Volume 50K (B)
R101,201 301	0B01888A	Carbon Resistor 10K ERD-25T J
R102,202 114,214 302	0B01679A	Carbon Resistor 100 ERD-25T J
R103,203 303	0B01683A	Carbon Resistor 15K ERD-25T J
R104,204 304	0B05668A	Carbon Resistor 82K ERD-25T J
R105,205 305	0B01856A	Carbon Resistor 8.2K ERD-25T J
R106,206 125,225 306	0B05641A	Carbon Resistor 47K ERD-25T J
R107,207 117,217 307	0B05615A	Carbon Resistor 22K ERD-25T J
R108,208 308	0B05579A	Carbon Resistor 22 ERD-25T J
R109,209 309	0B05640A	Carbon Resistor 180K ERD-25T J
R110,210 126,226 310	0B01846A	Carbon Resistor 4.7K ERD-25T J
R111,211 118,218 311	0B05576A	Carbon Resistor 470 ERD-25T J
R112,212 312	0B01887A	Carbon Resistor 5.6K ERD-25T J
R113,119 213,219 313,314	0B09203A	Metal Film Resistor 10K SN14K2E F
R115,215	0B05508A	Carbon Resistor 56K ERD-25T J
R116,216	0B05622A	Carbon Resistor 2.2K ERD-25T J
R120,123 220,223 320,323	0B05645A	Carbon Resistor 270 ERD-25T J
R121,221	0B09263A	Carbon Resistor 12K ERD-25T J
R122,222	0B09447A	Metal Film Resistor 34.8K SN14K2E F
R124,224	0B05577A	Carbon Resistor 330 ERD-25T J
R315,316	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
C101,104 106,109 201,204 206,209 301,304	0B01412A	Electrolytic Capacitor 10μ 16V
C102,107 202,207 302	0B09282A	Ceramic Capacitor 100P 50V K
C103,203 303	0B09151A	Electrolytic Capacitor 220μ 6.3V (LN)
C105,110 205,210 305,310	0B01403A	Electrolytic Capacitor 47μ 16V
C108,111 208,211	0B09251A	Electrolytic Capacitor 33μ 25V
C112,212 312	0B09276A	Ceramic Capacitor 5P 50V J
C306,307	0B01400A	Electrolytic Capacitor 100μ 16V
CN10	0B08754A	4P-H Connector 520mm
CN11	0B08779A	4P-H Connector
CN12	0B08780A	4P-H Connector
CN13	0B08755A	4P-H Connector 320mm
CN14	0B08753A	9P-H Connector 320mm
	BA04235A	**Playback Amp. and Dolby NR P.C.B. Ass'y** 2nd Version
	0B07875C	Playback Amp. and Dolby NR P.C.B.
IC101,201	0B06200A	IC μA7300PC
IC301	0B06205A	IC RC4559DD
Q101,201	0B06257A (0B06300A)	FET 2SK240 (BL) (2SK146 (V))
Q102,103 104,202 203,204	0B01872A	Transistor 2SC945 (L)
ZD301,302	0B06191A	Zener Diode 2.7V 2.7EB
ZD303,304	0B06233A	Zener Diode 10V RD10EB3
D101,201	0B01909A	Silicon Diode 1S1555
L101,201	0B06636A	Inductor 1.05mH
L102,202	0B00068A	Trap Coil 10.5mH
L103,203	0B03919B	Inductor 36mH
VR101,201	0B07353A	Semi-fixed Volume 200
VR102,202	0B07162A	Semi-fixed Volume 10K
R101,124 201,224	0B05615A	Carbon Resistor 22K ERD-25T J
R102,202	0B09540A	Metal Film Resistor 3.24K SN14K2E F
R103,107 203,207	0B01846A	Carbon Resistor 4.7K ERD-25T J
R104,204	0B01933A	Carbon Resistor 220 ERD-25T J
R105,205	0B09415A	Metal Film Resistor 68 SN14K2E F
R106,122 206,222	0B09422A	Metal Film Resistor 3.16K SN14K2E F
R108,132 208,232	0B01889A	Carbon Resistor 100K ERD-25T J
R109,209	0B09521A	Metal Film Resistor 523K SN14K2E F
R110,210	0B09205A	Metal Film Resistor 18K SN14K2E F
R111,112 113,211 212,213	0B01857A	Carbon Resistor 1K ERD-25T J
R114,116 214,216	0B09520A	Carbon Resistor 620K ERD-25T J
R115,128 130,215 228,230	0B05620A	Carbon Resistor 270K ERD-25T J
R117,217	0B05676A	Carbon Resistor 390K ERD-25T J
R118,218	0B01854A	Carbon Resistor 39K ERD-25T J
R119,219	0B01887A	Carbon Resistor 5.6K ERD-25T J

Schematic Ref. No.	Part No.	Description
R120,220	0B05577A	Carbon Resistor 330 ERD-25T J
R121,221	0B09421A	Metal Film Resistor 2.67K SN14K2E F
R123,127 223,227	0B05641A	Carbon Resistor 47K ERD-25T J
R125,131 225,231	0B01888A	Carbon Resistor 10K ERD-25T J
R126,226	0B09317A	Metal Film Resistor 3.3K SN14K2E F
R129,229	0B09271A	Carbon Resistor 6.2K ERD-25T J
R133,233	0B05671A	Carbon Resistor 2.2M ERD-25T J
R134,234	0B01679A	Carbon Resistor 100 ERD-25T J
R301	0B05625A	Carbon Resistor 220K ERD-25T J
R303,304	0B09306A	Fail Safe Type Resistor 68 RDF-25S J
C101,201	0B09486A	Mica Capacitor 120P 50V J
C102,202	0B05681A	Mylar Capacitor 0.01μ 50V J
C103,203	0B09152A	Electrolytic Capacitor 470μ 6.3V (LN)
C104,204	0B09489A	PP Capacitor 5600P 100V G
C105,205	0B05550A	Mylar Capacitor 1000P 50V J
C106,206	0B09345A	Electrolytic Capacitor 3.3μ 25V (BP)
C107,108 128,129 207,208 228,229 303,304 305,306	0B01400A	Electrolytic Capacitor 100μ 16V
C109,209	0B09410A	PP Capacitor 2200P 100V J
C110,113 210,213	0B09189A	Mylar Capacitor 2700P 50V J
C111,211	0B09275A	Mica Capacitor 200P 50V J
C112,212	0B09235A	PP Capacitor 680P 100V J
C114,116 214,216	0B05813A	Mylar Capacitor 0.056μ 50V J
C115,126 215,226	0B01780A	Mylar Capacitor 0.1μ 50V J
C117,217	0B09413A	PP Capacitor 0.022μ 100V G
C118,122 218,222	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)
C119,219	0B09257A	Electrolytic Capacitor 2200μ 6.3V
C120,220	0B09240A	PP Capacitor 0.033μ 100V G
C121,221	0B09191A	PP Capacitor 4700P 100V G
C123,223	0B01862A	Electrolytic Capacitor 22μ 16V
C124,224	0B01405A	Electrolytic Capacitor 1μ 50V
C125,225	0B05583A	Mylar Capacitor 0.033μ 50V J
C127,227	0B09399A	Mylar Capacitor 0.33μ 100V K
C130,230	0B09400A	Mica Capacitor 250P 50V J
C131,231	0B09270A	PP Capacitor 470P 50V J
C301,302	0B01412A	Electrolytic Capacitor 10μ 16V
CN46	0B08727A	5P-S Connector F5P-SHVQ
CN47	0B08728A	6P-S Connector F6P-SHVQ
CN53	0B08654A	4P-T Post
	0B08714A	IC Socket 16P (2 pcs.)

7.17. Playback Amp. and Dolby NR P.C.B. Ass'y



CN-53
CN-44
CN-47
IC301 RC4559DD
IC101 μA7300PC
IC201 μA7300PC
VR101 200
VR201 200
VR102 10K
VR202 10K
L101 1.05mH
L201 1.05mH
L102 10.5mH
L202 10.5mH
L103 36mH
L203 36mH
ZD301 2.7V
ZD303 10V
ZD304 10V
D101
D201
R301 220K
R303 68
R304 68
R123 47K
R232 100K
C206 3.3μ 25V (BP)
C106 3.3μ 25V (BP)
C102 0.01μ(J)
C202 0.01μ(J)
C304 100μ 16V
C305 100μ 16V
C306 100μ 16V
PB DOLBY PCB
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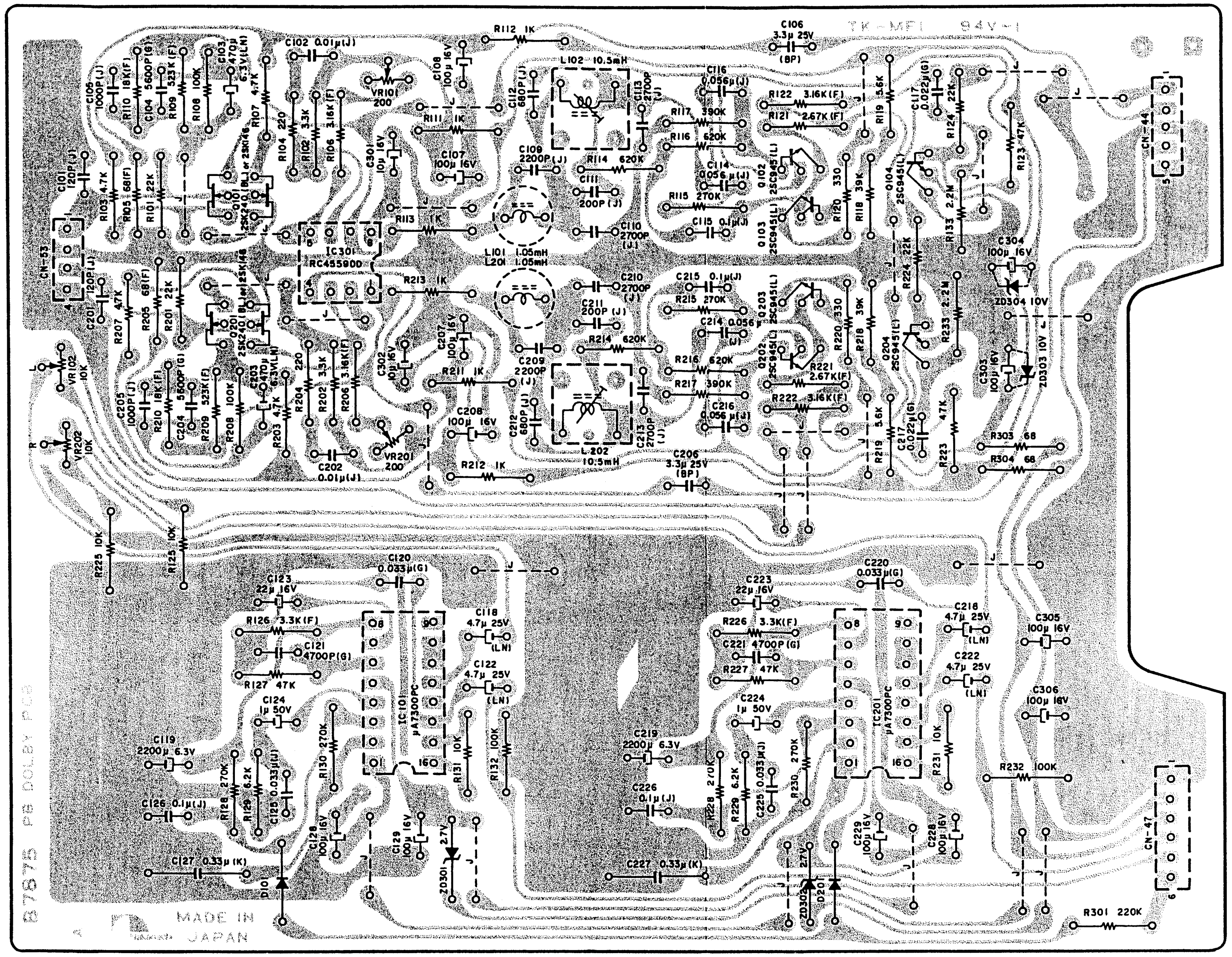
Fig. 7.17.1 2nd Version

Note: Diode is 1SS53 unless otherwise specified.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CN-47
CN-53
IC101 μA7300PC
IC201 μA7300PC
IC301 RC4559DD
L101 1.05mH
L201 1.05mH
L102 10.5mH
L202 10.5mH
VR101 200
VR201 200
VR102 10K
VR202 10K
ZD301 2.7V
ZD302 2.7V
ZD303 10V
ZD304 10V
D101
D201
R301 220K
R303 68
R304 68
B7875 PB DOLBY PCB
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Fig. 7.17.2 1st Version

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04235A	**Playback Amp. and Dolby NR P.C.B. Ass'y** 1st Version
	0B07875A	Playback Amp. and Dolby NR P.C.B.
IC101,201	0B06200A	IC μA7300PC
IC301	0B06205A	IC RC4559DD
Q101,201	0B06257A (0B06300A)	FET 2SK240 (BL) (2SK146 (V))
Q102,103 104,202 203,204	0B01872A	Transistor 2SC945 (L)
ZD301,302	0B06191A	Zener Diode 2.7V 2.7EB
ZD303,304	0B06233A	Zener Diode 10V RD10EB3
D101,201	0B01909A	Silicon Diode 1S1555
L101,201	0B06636A	Inductor 1.05mH
L102,202	0B00068A	Trap Coil 10.5mH
VR101,201	0B07353A	Semi-fixed Volume 200
VR102,202	0B07162A	Semi-fixed Volume 10K
R101,124 201,224	0B05615A	Carbon Resistor 22K ERD-25T J
R102,202	0B01681A	Carbon Resistor 3.3K ERD-25T J
R103,107 203,207	0B01846A	Carbon Resistor 4.7K ERD-25T J
R104,204	0B01933A	Carbon Resistor 220 ERD-25T J
R105,205	0B09415A	Metal Film Resistor 68 SN14K2E F
R106,122 206,222	0B09422A	Metal Film Resistor 3.16K SN14K2E F
R108,132 208,232	0B01889A	Carbon Resistor 100K ERD-25T J
R109,209	0B09521A	Metal Film Resistor 523K SN14K2E F
R110,210	0B09205A	Metal Film Resistor 18K SN14K2E F
R111,112 113,211 212,213	0B01857A	Carbon Resistor 1K ERD-25T J
R114,116 214,216	0B09520A	Carbon Resistor 620K ERD-25T J
R115,128 130,215 228,230	0B05620A	Carbon Resistor 270K ERD-25T J
R117,217	0B05676A	Carbon Resistor 390K ERD-25T J
R118,218	0B01854A	Carbon Resistor 39K ERD-25T J
R119,219	0B01887A	Carbon Resistor 5.6K ERD-25T J
R120,220	0B05577A	Carbon Resistor 330 ERD-25T J
R121,221	0B09421A	Metal Film Resistor 2.67K SN14K2E F
R123,127 223,227	0B05641A	Carbon Resistor 47K ERD-25T J
R125,131 225,231	0B01888A	Carbon Resistor 10K ERD-25T J
R126,226	0B09317A	Metal Film Resistor 3.3K SN14K2E F
R129,229	0B09271A	Carbon Resistor 6.2K ERD-25T J
R133,233	0B05671A	Carbon Resistor 2.2M ERD-25T J
R301	0B05625A	Carbon Resistor 220K ERD-25T J
R303,304	0B09306A	Fail Safe Type Resistor 68
C101,201	0B09486A	Mica Capacitor 120P 50V J
C102,202	0B05681A	Mylar Capacitor 0.01μ 50V J
C103,203	0B09152A	Electrolytic Capacitor 470μ 6.3V (LN)
C104,204	0B09489A	PP Capacitor 5600P 100V G
C105,205	0B05550A	Mylar Capacitor 1000P 50V J
C106,206	0B09345A	Electrolytic Capacitor 3.3μ 25V (BP)

Schematic Ref. No.	Part No.	Description
C107,108 128,129 207,208 228,229 303,304 305,306	0B01400A	Electrolytic Capacitor 100μ 16V
C109,209	0B09410A	PP Capacitor 2200P 100V J
C110,113 210,213	0B09189A	Mylar Capacitor 2700P 50V J
C111,211	0B09275A	Mica Capacitor 200P 50V J
C112,212	0B09235A	PP Capacitor 680P 100V J
C114,116 214,216	0B05813A	Mylar Capacitor 0.056μ 50V J
C115,126 215,226	0B01780A	Mylar Capacitor 0.1μ 50V J
C117,217	0B09413A	PP Capacitor 0.022μ 100V G
C118,122 218,222	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)
C119,219	0B09257A	Electrolytic Capacitor 2200μ 6.3V
C120,220	0B09240A	PP Capacitor 0.033μ 100V G
C121,221	0B09191A	PP Capacitor 4700P 100V G
C123,223	0B01862A	Electrolytic Capacitor 22μ 16V
C124,224	0B01405A	Electrolytic Capacitor 1μ 50V
C125,225	0B05583A	Mylar Capacitor 0.033μ 50V J
C127,227	0B09399A	Mylar Capacitor 0.33μ 100V K
C301,302	0B01412A	Electrolytic Capacitor 10μ 16V
CN46	0B08727A	5P-S Connector F5P-SHVQ
CN47	0B08728A	6P-S Connector F6P-SHVQ
CN53	0B08654A	4P-T Post
	0B08714A	IC Socket 16P (2 pcs.)

7.18. Main P.C.B. Ass'y

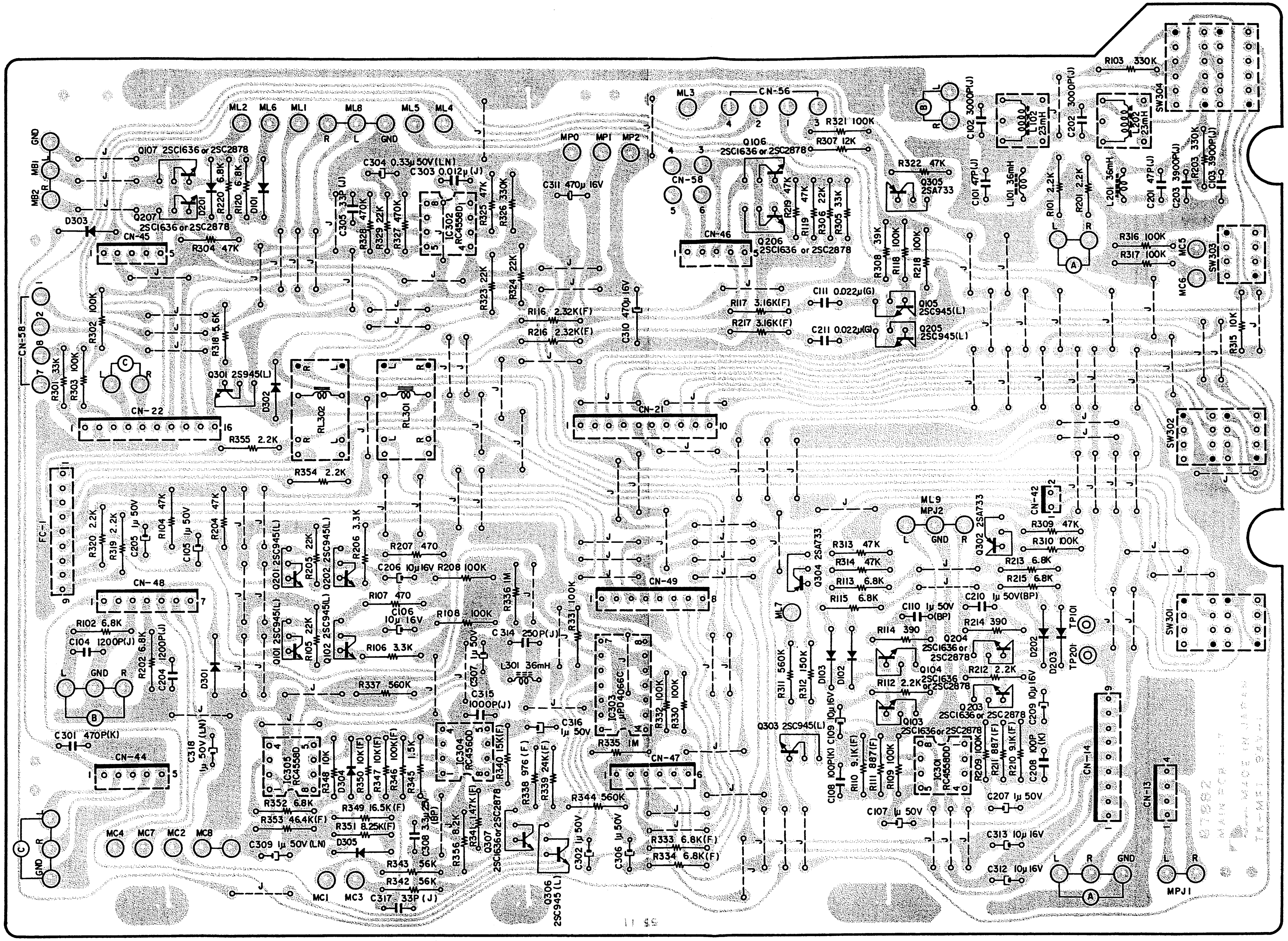

ML2
ML6
ML1
ML8
ML5
ML4
ML3
CN-56
MP0
MP1
MP2
CN-58
CN-46
CN-45
CN-22
CN-21
CN-48
CN-49
CN-47
CN-44
CN-42
CN-14
CN-13
FC-1
RL302
RL301
Q107 2SC1636 or 2SC2878
Q207 2SC1636 or 2SC2878
Q106 2SC1636 or 2SC2878
Q206 2SC1636 or 2SC2878
Q305 2SA733
Q105 2SC945(L)
Q205 2SC945(L)
Q301 2SC945(L)
Q302 2SA733
Q304 2SA733
Q303 2SC945(L)
Q306 2SC945(L)
Q307 2SC1636 or 2SC2878
IC302 RC4558D
IC303 μPD4066C
IC304 RC4560D
IC305 RC4558D
IC301 RC4558D
C304 0.33μ 50V(LN)
C303 0.012μ (J)
C311 470μ 16V
C310 470μ 16V
C111 0.022μ(G)
C211 0.022μ(G)
R321 100K
R307 12K
R322 47K
R116 2.32K(F)
R216 2.32K(F)
R117 3.16K(F)
R217 3.16K(F)
R103 330K
R203 330K
R316 100K
R317 100K
L101 36mH
L201 36mH
L102 2.2mH
L202 2.2mH
L301 36mH
SW304
SW303
SW302
SW301
MC5
MC6
MB1
MB2
GND
D303
R304 47K
R355 2.2K
R354 2.2K
R207 470
R208 100K
R107 470
R108 100K
R106 3.3K
R337 560K
C314 250P(J)
C315 1000P(J)
C316 1μ 50V
R335 1M
R344 560K
R333 6.8K(F)
R334 6.8K(F)
C301 470P(K)
C104 1200P(J)
R102 6.8K
R352 6.8K
R353 46.4K(F)
R349 16.5K(F)
R351 8.25K(F)
R343 56K
R342 56K
C317 33P(J)
C309 1μ 50V(LN)
D305
MC4
MC7
MC2
MC8
MC1
MC3
ML9
MPJ2
ML7
R309 47K
R310 100K
R313 47K
R314 47K
R113 6.8K
R115 6.8K
R213 6.8K
R215 6.8K
C110 1μ 50V(BP)
C210 1μ 50V(BP)
R114 390
R214 390
R112 2.2K
R212 2.2K
Q104
Q204 2SC1636 or 2SC2878
Q103
Q203 2SC1636 or 2SC2878
TP101
TP201
D202
D203
C207 1μ 50V
C107 1μ 50V
C313 10μ 16V
C312 10μ 16V
MPJ1

Fig. 7.18.1   2nd Version

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04227A	Main P.C.B. Ass'y 2nd Version
	0B07882C	Main P.C.B.
IC301	0B06146A	IC RC4558DD
IC302,305	0B06124B	IC RC4558D
IC303	0B06144A	IC μPD4066C
IC304	0B06217A	IC RC4560D
Q101,102 105,201 202,205 301,303 306	0B01872A	Transistor 2SC945 (L)
Q103,104 106,107 203,204 206,207 307	0B06070A (0B06299A)	Transistor 2SC1636 (2SC2878)
Q302,304 305	0B06013A	Transistor 2SA733
D101-103 201-203 301-305	0B06181A	Silicon Diode 1SS53 (11 pcs.)
L101,201 301	0B03919B	Inductor 36mH
L102,202	0B03563A	19K Coil 23mH
R101,112 201,212 319,320 354,355	0B05622A	Carbon Resistor 2.2K ERD-25T J
R102,113 115,120 202,213 215,220 352	0B01682A	Carbon Resistor 6.8K ERD-25T J
R103,203 326	0B05627A	Carbon Resistor 330K ERD-25T J
R104,119 204,219 304,309 313,314 322,325	0B05641A	Carbon Resistor 47K ERD-25T J
R105,205 306,323 324,329	0B05615A	Carbon Resistor 22K ERD-25T J
R106,206	0B01681A	Carbon Resistor 3.3K ERD-25T J
R107,207	0B05576A	Carbon Resistor 470 ERD-25T J
R108,109 118,208 209,218 302,303 310,316 317,321 330,331 332	0B01889A	Carbon Resistor 100K ERD-25T J
R110,210	0B09328A	Metal Film Resistor 9.1K SN14K2E F
R111,211	0B09550A	Metal Film Resistor 887 SN14K2E F
R114,214	0B05691A	Carbon Resistor 390 ERD-25T J
R116,216	0B09468A	Metal Film Resistor 2.32K SN14K2E F
R117,217	0B09422A	Metal Film Resistor 3.16K SN14K2E F
R301,305	0B05509A	Carbon Resistor 33K ERD-25T J
R307	0B09263A	Carbon Resistor 12K ERD-25T J
R308	0B01854A	Carbon Resistor 39K ERD-25T J
R311,337 344	0B05784A	Carbon Resistor 560K ERD-25T J
R312	0B05626A	Carbon Resistor 150K ERD-25T J
R315,348	0B01888A	Carbon Resistor 10K ERD-25T J
R318	0B01887A	Carbon Resistor 5.6K ERD-25T J
R327,328	0B01684A	Carbon Resistor 470K ERD-25T J
R333,334	0B09529A	Metal Film Resistor 6.8K SN14K2E F
R335,336	0B05776A	Carbon Resistor 1M ERD-25T J
R338	0B09416A	Metal Film Resistor 976 SN14K2E F
R339	0B09005A	Metal Film Resistor 24K SN14K2E F
R340	0B09340A	Metal Film Resistor 15K SN14K2E F
R341	0B09551A	Metal Film Resistor 1.47K SN14K2E F
R342,343	0B05508A	Carbon Resistor 56K ERD-25T J
R345	0B05698A	Carbon Resistor 1.5K ERD-25T J
R346	0B09305A	Metal Film Resistor 100K SN14K2E F
R347,350	0B09203A	Metal Film Resistor 10K SN14K2E F
R349	0B09438A	Metal Film Resistor 16.5K SN14K2E F
R351	0B09432A	Metal Film Resistor 8.25K SN14K2E F
R353	0B09450A	Metal Film Resistor 46.4K SN14K2E F
R356	0B01856A	Carbon Resistor 8.2K ERD-25T J
C101,201	0B09242A	Mica Capacitor 47P 50V J
C102,202	0B09262A	PP Capacitor 3000P 50V J
C103,203	0B01804A	Mylar Capacitor 3900P 50V J
C104,204	0B05687A	Mylar Capacitor 1200P 50V J
C105,107 205,207 302,306 307,316	0B01405A	Electrolytic Capacitor 1μ 50V
C106,109 206,209 312,313	0B01412A	Electrolytic Capacitor 10μ 16V
C108,208	0B09282A	Ceramic Capacitor 100P 50V K
C110,210	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C111,211	0B09413A	PP Capacitor 0.022μ 100V G
C301	0B09286A	Ceramic Capacitor 470P 50V K
C303	0B05843A	Mylar Capacitor 0.012μ 50V J
C304	0B09385A	Electrolytic Capacitor 0.33μ 50V (LN)
C305,317	0B09370A	Ceramic Capacitor 33P 50V J
C308	0B09345A	Electrolytic Capacitor 3.3μ 25V (BP)
C309,318	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C310,311	0B01392A	Electrolytic Capacitor 470μ 16V
C314	0B09400A	Mica Capacitor 250P 50V J
C315	0B05550A	Mylar Capacitor 1000P 50V J
RL301,302	0B07326A	FBR Relay 12V
SW301	0B07324A	Rotary Switch 4-2N
SW302	0B07322A	Rotary Switch 4-2S
SW303	0B07323A	Rotary Switch 2-3N
SW304	0B07321A	Rotary Switch 4-4S
CN13	0B08654A	4P-T Post
CN14	0B08645A	9P-T Post
CN21,22	0B08615A	10P-T Post B10P-SHF-1
CN42	0B08656A	2P-T Post
CN44,45 46	0B08183A	5P-T Post B5P-SHF-1
CN47	0B08182A	6P-T Post B6P-SHF-1
CN48	0B08302A	7P-T Post B7P-SHF-1
CN49	0B08334A	8P-T Post B8P-SHF-1
CN56	0B08736A	4P-H Connector 600mm
CN58	0B08737A	8P-H Connector 500mm

Schematic Ref. No.	Part No.	Description
	BA04227A	**Main P.C.B. Ass'y** 1st Version
	0B07882A	Main P.C.B.
IC301	0B06146A	IC RC4558DD
IC302,305	0B06124B	IC RC4558D
IC303	0B06144A	IC μPD4066C
IC304	0B06217A	IC RC4560D
Q101,102 105,201 202,205 301,303 306	0B01872A	Transistor 2SC945 (L)
Q103,104 106,107 203,204 206,207 307	0B06070A (0B06299A)	Transistor 2SC1636 (2SC2878)
Q302,304 305	0B06013A	Transistor 2SA733
D101-103 201-203 301-305	0B06181A	Silicon Diode 1SS53 (11 pcs.)
L101,201 301	0B03919B	Inductor 36mH
L102,202	0B03563A	19K Coil 23mH
R101,112 201,212 319,320 354,355	0B05622A	Carbon Resistor 2.2K ERD-25T J
R102,113 115,120 202,213 215,220 352	0B01682A	Carbon Resistor 6.8K ERD-25T J
R103,203 326	0B05627A	Carbon Resistor 330K ERD-25T J
R104,119 204,219 304,309 313,314 322,325	0B05641A	Carbon Resistor 47K ERD-25T J
R105,205 306,323 324,329	0B05615A	Carbon Resistor 22K ERD-25T J
R106,206	0B01681A	Carbon Resistor 3.3K ERD-25T J
R107,207	0B05576A	Carbon Resistor 470 ERD-25T J
R108,109 118,208 209,218 302,303 310,316 317,321 330,331 332	0B01889A	Carbon Resistor 100K ERD-25T J
R110,210	0B09328A	Metal Film Resistor 9.1K SN14K2E F
R111,211	0B09491A	Metal Film Resistor 1K SN14K2E F
R114,214	0B05691A	Carbon Resistor 390 ERD-25T J
R116,216	0B09468A	Metal Film Resistor 2.32K SN14K2E F
R117,217	0B09422A	Metal Film Resistor 3.16K SN14K2E F
R301,305	0B05509A	Carbon Resistor 33K ERD-25T J
R307	0B09263A	Carbon Resistor 12K ERD-25T J
R308	0B01854A	Carbon Resistor 39K ERD-25T J
R311,337 344	0B05784A	Carbon Resistor 560K ERD-25T J
R312	0B05626A	Carbon Resistor 150K ERD-25T J
R315,348	0B01888A	Carbon Resistor 10K ERD-25T J
R318	0B01887A	Carbon Resistor 5.6K ERD-25T J
R327,328	0B01684A	Carbon Resistor 470K ERD-25T J
R333,334	0B09529A	Metal Film Resistor 6.8K SN14K2E F
R335,336	0B05776A	Carbon Resistor 1M ERD-25T J
R338	0B09416A	Metal Film Resistor 976 SN14K2E F
R339	0B09005A	Metal Film Resistor 24K SN14K2E F
R340	0B09340A	Metal Film Resistor 15K SN14K2E F
R341	0B09492A	Metal Film Resistor 1.62K SN14K2E F
R342,343 357	0B05508A	Carbon Resistor 56K ERD-25T J
R345	0B05698A	Carbon Resistor 1.5K ERD-25T J
R346	0B09305A	Metal Film Resistor 100K SN14K2E F
R347,350	0B09203A	Metal Film Resistor 10K SN14K2E F
R349	0B09438A	Metal Film Resistor 16.5K SN14K2E F
R351	0B09432A	Metal Film Resistor 8.25K SN14K2E F
R353	0B09450A	Metal Film Resistor 46.4K SN14K2E F
R356	0B01856A	Carbon Resistor 8.2K ERD-25T J
C101,201	0B09242A	Mica Capacitor 47P 50V J
C102,202	0B09262A	PP Capacitor 3000P 50V J
C103,203	0B01804A	Mylar Capacitor 3900P 50V J
C104,204	0B05687A	Mylar Capacitor 1200P 50V J
C105,107 205,207 302,306 307,316	0B01405A	Electrolytic Capacitor 1μ 50V
C106,109 206,209 312,313	0B01412A	Electrolytic Capacitor 10μ 16V
C108,208	0B09282A	Ceramic Capacitor 100P 50V K
C110,210	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C111,211	0B09413A	PP Capacitor 0.022μ 100V G
C301	0B09286A	Ceramic Capacitor 470P 50V K
C303	0B05843A	Mylar Capacitor 0.012μ 50V J
C304	0B09385A	Electrolytic Capacitor 0.33μ 50V (LN)
C305,317	0B09370A	Ceramic Capacitor 33P 50V J
C308	0B09345A	Electrolytic Capacitor 3.3μ 25V (BP)
C309,318	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C310,311	0B01392A	Electrolytic Capacitor 470μ 16V
C314	0B09400A	Mica Capacitor 250P 50V J
C315	0B05550A	Mylar Capacitor 1000P 50V J
C319	0B09219A	Electrolytic Capacitor 6.8μ 16V (LN)
RL301,302	0B07326A	FBR Relay 12V
SW301	0B07324A	Rotary Switch 4-2N
SW302	0B07322A	Rotary Switch 4-2S
SW303	0B07323A	Rotary Switch 2-3N
SW304	0B07321A	Rotary Switch 4-4S
CN13	0B08654A	4P-T Post
CN14	0B08645A	9P-T Post
CN21,22	0B08615A	10P-T Post B10P-SHF-1
CN42	0B08656A	2P-T Post
CN44,45 46	0B08183A	5P-T Post B5P-SHF-1
CN47	0B08182A	6P-T Post B6P-SHF-1
CN48	0B08302A	7P-T Post B7P-SHF-1
CN49	0B08334A	8P-T Post B8P-SHF-1
CN56	0B08736A	4P-H Connector 600mm
CN58	0B08737A	8P-H Connector 500mm

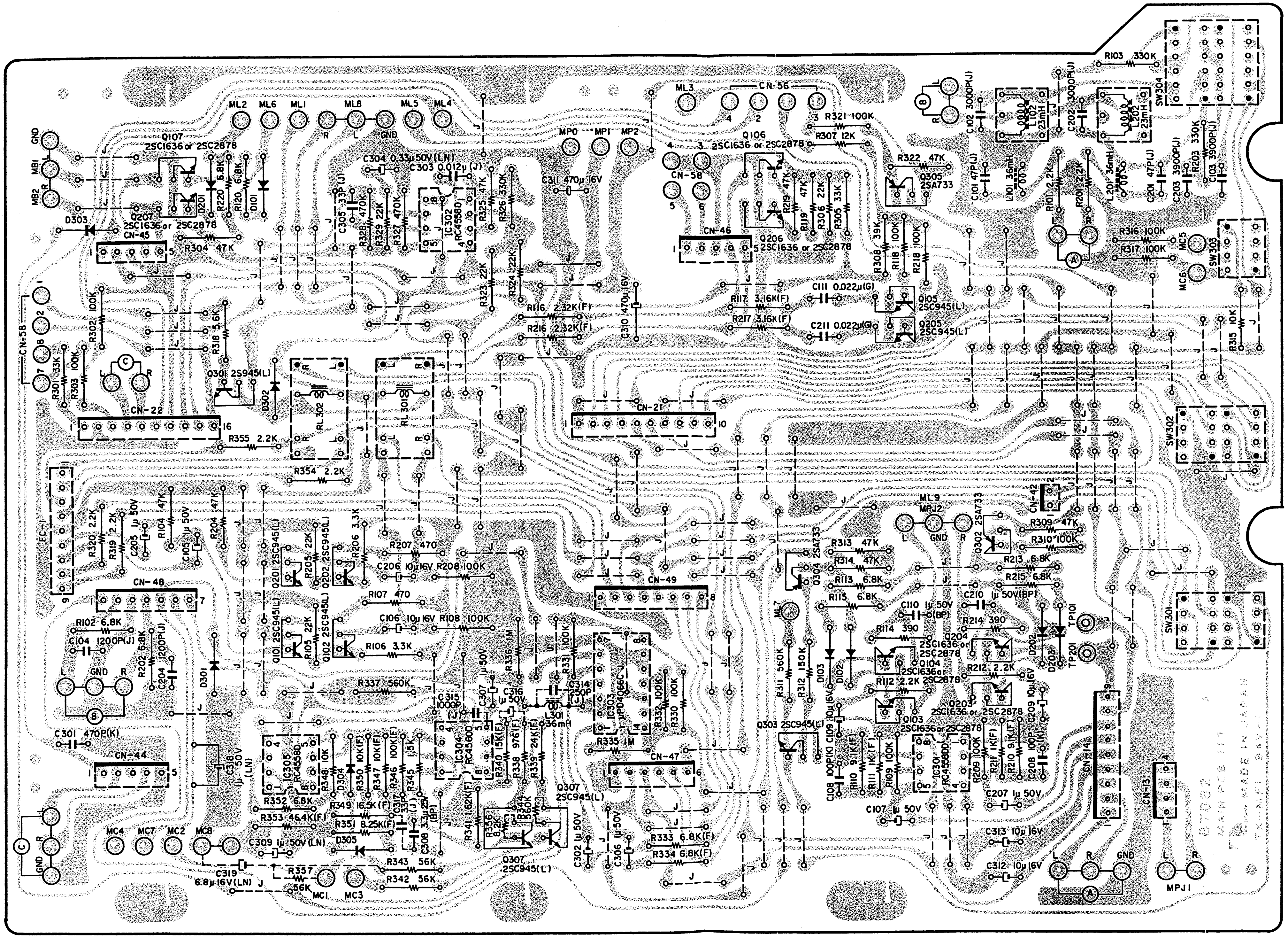

ML2
ML6
ML1
ML8
ML5
ML4
ML3
CN-56
MP0
MP1
MP2
GND
MB1
MB2
Q107 2SC1636 or 2SC2878
Q207 2SC1636 or 2SC2878
D303
CN-45
R304 47K
C304 0.33μ 50V(LN)
C303 0.012μ (J)
IC302 RC4558D
C311 470μ 16V
Q106 2SC1636 or 2SC2878
Q206 2SC1636 or 2SC2878
CN-58
CN-46
R321 100K
R307 12K
R322 47K
Q305 2SA733
R103 330K
SW304
C102 3000P(J)
C202 3000P(J)
L102 23mH
L202 23mH
L101 36mH
L201 36mH
C101 47P(J)
C201 47P(J)
C203 3900P(J)
C103 3900P(J)
R203 330K
R101 2.2K
R201 2.2K
R316 100K
R317 100K
MC5
MC6
SW303
R117 3.16K(F)
R217 3.16K(F)
C111 0.022μ(G)
C211 0.022μ(G)
Q105 2SC945(L)
Q205 2SC945(L)
R116 2.32K(F)
R216 2.32K(F)
C310 470μ 16V
R315 10K
R302 100K
R318 5.6K
Q301 2SC945(L)
D302
RL302
RL301
R301 33K
R303 100K
CN-22
CN-21
R355 2.2K
R354 2.2K
SW302
FC-1
R320 2.2K
R319 2.2K
C205 1μ 50V
R104 47K
C105 1μ 50V
R204 47K
Q201 2SC945(L)
Q202 2SC945(L)
R205 22K
R206 3.3K
R207 470
C206 10μ 16V
R208 100K
R107 470
C106 10μ 16V
R108 100K
R106 3.3K
Q101 2SC945(L)
Q102 2SC945(L)
R105 22K
CN-48
CN-49
R102 6.8K
C104 1200P(J)
R202 6.8K
C204 1200P(J)
D301
R337 560K
R336 1M
R331 100K
C315 1000P
C307 1μ 50V
C316 1μ 50V
L301 36mH
C314
IC303 μPD4066C
R332 100K
R330 100K
R335 1M
CN-47
C301 470P(K)
CN-44
C318 1μ 50V (LN)
IC305 RC4558D
IC304 RC4558D
R348 10K
D304
R350 10K(F)
R347 10K(F)
R346 100K(F)
R345 1.5K
R340 15K(F)
R338 976(F)
R339 24K(F)
R352 6.8K
R349 16.5K(F)
R353 46.4K(F)
R351 8.25K(F)
C317 33P(J)
C308 3.3μ 25V (BP)
R341 1.62K(F)
R356 8.2K
R344 330K
Q307 2SC945(L)
C302 1μ 50V
C306 1μ 50V
R333 6.8K(F)
R334 6.8K(F)
MC4
MC7
MC2
MC8
C309 1μ 50V(LN)
D305
R343 56K
R342 56K
R357 56K
C319 6.8μ 16V(LN)
MC1
MC3
ML9
MPJ2
Q302 2SA733
Q304 2SA733
R309 47K
R310 100K
R313 47K
R314 47K
R113 6.8K
R213 6.8K
R215 6.8K
R115 6.8K
C110 1μ 50V (BP)
C210 1μ 50V(BP)
R114 390
R214 390
CN-42
SW301
TP101
TP201
D202
D203
ML7
R311 560K
R312 150K
D103
D102
Q204 2SC1636 or 2SC2878
Q104 2SC1636 or 2SC2878
R212 2.2K
R112 2.2K
Q103 2SC1636 or 2SC2878
Q203 2SC1636 or 2SC2878
C209 10μ 16V
Q303 2SC945(L)
C109 10μ 16V
C108 100P(K)
R110 9.1K(F)
R111 1K(F)
R109 100K
IC301 RC4558D
R209 100K
R211 1K(F)
R210 9.1K(F)
C208 100P(K)
CN-14
CN-13
C207 1μ 50V
C107 1μ 50V
C313 10μ 16V
C312 10μ 16V
MPJ1
MADE IN JAPAN
94V-1

Fig. 7.18.2 1st Version

Note: Diode is 1SS53 unless otherwise specified.

7.19. Logic P.C.B. Ass'y

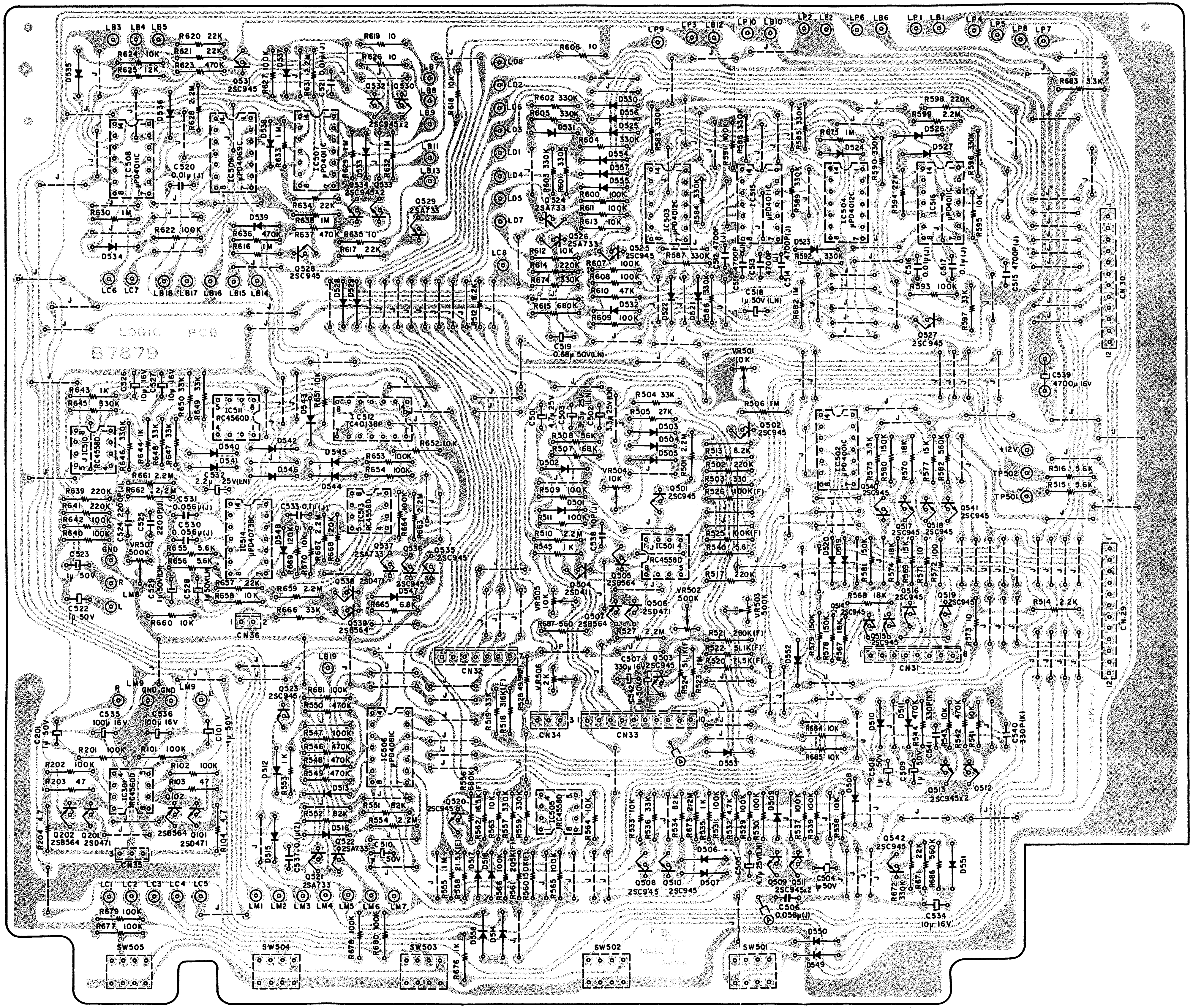

LB3
LB4
LB5
R620 22K
R621 22K
R624 10K
R625 12K
R623 470K
Q531 2SC945
R619 10
R626 10
R606 10
LP9
LP3
LB12
LP10
LB10
LP2
LB2
LP6
LB6
LP1
LB1
LP4
LP5
LP8
LP7
LD8
LD2
LD6
LD3
LD1
LD4
LD5
LD7
LB7
LB8
LB9
LB11
LB13
IC508 µPD4011C
IC509 µPD4069C
IC507 µPD4011C
IC503 µPD4012C
IC505 µPD4011C
IC504 µPD4012C
IC516 µPD4011C
C520 0.01µ (J)
R630 1M
R622 100K
D534
D539
R634 22K
R636 470K
R637 470K
R638 1M
R616 1M
R617 22K
R635 10
Q528 2SC945
Q529 2SA733
Q532
Q530
2SC945x2
Q534
Q533
2SC945x2
R602 330K
R605 330K
R604 330K
D530
D556
D525
D554
D555
D553
R600 100K
R611 100K
R613 10K
Q524 2SA733
Q526 2SA733
Q525 2SC945
R612 10K
R614 220K
R674 330K
R607 100K
R608 100K
R610 47K
R609 100K
R615 680K
D532
R587 330K
R592 330K
D523
C518 1µ 50V (LN)
Q527 2SC945
R593 100K
R598 220K
R599 2.2M
R675 1M
D524
D526
D527
R683 3.3K
CN30
LC6
LC7
LB18
LB17
LB16
LB15
LB14
LC8
LOGIC PCB
B7879
C519 0.68µ 50V (LN)
VR501 10K
C539 4700µ 16V
R643 1K
R645 330K
IC511 RC4560D
IC512 TC4013BP
IC510 RC4558D
R652 10K
R653 100K
R654 100K
D540
D541
D542
D545
D546
D544
C532 2.2µ 25V (LN)
R661 2.2M
R662 2.2M
R639 220K
R641 220K
R642 100K
R640 100K
C531 0.056µ (J)
C530 0.056µ (J)
C533 0.1µ (J)
IC513 RC4558D
IC514 µPD4073BC
VR507 500K
C523 1µ 50V
C522 1µ 50V
R655 5.6K
R656 5.6K
R657 22K
R658 10K
R659 2.2M
R660 10K
R666 33K
R665 6.8K
Q537
Q536
Q535
Q538 2SD471
Q539 2SB564
D547
CN36
LM8
R504 33K
R505 27K
R506 1M
D503
D504
D505
Q502 2SC945
R508 56K
R507 68K
D502
VR504 10K
R509 100K
R511 100K
D501
R510 2.2M
R545 1K
Q501 2SC945
IC501 RC4558D
R513 8.2K
R502 220K
R503 330
R526 100K (F)
R525 100K (F)
R540 5.6
R517 220K
VR502 500K
VR503 500K
VR505 10K
Q505 2SB564
Q504 2SD471
Q506 2SD471
Q507 2SB564
R687 560
R527 2.2M
R521 200K (F)
R522 5.1K (F)
R520 71.5K (F)
C507 330µ 16V
Q503 2SC945
CN32
VR506 2K
CN34
CN33
IC502 µPD4001C
+12V
TP502
TP501
R516 5.6K
R515 5.6K
Q541 2SC945
Q517 2SC945
Q518 2SC945
Q516 2SC945
Q519 2SC945
Q514 2SC945
Q515 2SC945
R568 18K
R514 2.2K
CN31
CN29
LM9
GND
C535 100µ 16V
C536 100µ 16V
C201 1µ 50V
C101 1µ 50V
R201 100K
R101 100K
R202 100K
R102 100K
R203 47
R103 47
R204 4.7
R104 4.7
IC301 RC4560D
Q202 2SB564
Q201 2SD471
Q102 2SB564
Q101 2SD471
CN35
LB19
Q523 2SC945
R681 100K
R550 470K
R547 100K
R546 470K
R548 470K
R549 470K
D513
D512
IC506 µPD4081C
R552 82K
R551 82K
R554 2.2M
D516
Q522 2SA733
Q521 2SA733
C510 1µ 50V
C537 0.1µ (J)
D515
Q520 2SC945
IC515 µPD4011C
D553
R684 10K
R685 10K
C540 330P (K)
Q513 2SC945x2
Q512
Q542 2SC945
R672 330K
R671
R686
D551
C534 10µ 16V
Q508 2SC945
Q510 2SC945
Q509 2SC945x2
Q511
D506
D507
C504 1µ 50V
C506 0.056µ (J)
LC1
LC2
LC3
LC4
LC5
R679 100K
R677 100K
LM1
LM2
LM3
LM4
LM5
LM6
LM7
SW505
SW504
SW503
SW502
SW501
D550
D549
D558
D514

Fig. 7.19

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04244B	Logic P.C.B. Ass'y
	0B07879C	Logic P.C.B.
IC301,511	0B06217A	IC RC4560D
IC501,505 510,513	0B06124B	IC RC4558D
IC502	0B06143A	IC µPD4001C
IC503,504	0B06263A	IC µPD4012C
IC506	0B06219A	IC µPD4081C
IC507,508 515,516	0B06178A	IC µPD4011C
IC509	0B06270A	IC µPD4069C
IC512	0B06213A	IC TC4013BP
IC514	0B06244A	IC µPD4073BC
Q101,201 504,506 538	0B06066A	Transistor 2SD471
Q102,202 505,507 539	0B06069A	Transistor 2SB564
Q501-503 508-520 523,525 527,528 530-536 540-542	0B06100A	Transistor 2SC945 (A) (30 pcs.)
Q521,522 524,526 529,537	0B06013A	Transistor 2SA733
D501-558	0B01909A	Silicon Diode 1S1555 (58 pcs.)
VR501,504 505	0B07256A	Semi-fixed Volume 10K
VR502,503 507	0B07330A	Semi-fixed Volume 500K
VR506	0B07329A	Semi-fixed Volume 2K
R101,102 201,202 509,511 529,530 531,537 539,547 565,566 591,593 600,607 608,609 611,622 627,640 642,653 654,664 677,678 679,680 681	0B01889A	Carbon Resistor 100K ERD-25T J
R103,203	0B01706A	Carbon Resistor 47 ERD-25T J
R104,204	0B09321A	Fail Safe Type Resistor 4.7 RDF-25S J
R501,510 527,554 599,628 631,659 661,662 663,667 673	0B05671A	Carbon Resistor 2.2M ERD-25T J

Schematic Ref. No.	Part No.	Description
R502,517 598,614 639,641	0B05625A	Carbon Resistor 220K ERD-25T J
R503	0B05577A	Carbon Resistor 330 ERD-25T J
R504,519 536,597 647,648 649,650 666	0B05509A	Carbon Resistor 33K ERD-25T J
R505	0B05743A	Carbon Resistor 27K ERD-25T J
R506,523 555,616 629,630 632,633 638,675 682	0B05776A	Carbon Resistor 1M ERD-25T J
R507	0B05692A	Carbon Resistor 68K ERD-25T J
R508	0B05508A	Carbon Resistor 56K ERD-25T J
R512,513	0B01856A	Carbon Resistor 8.2K ERD-25T J
R514	0B05622A	Carbon Resistor 2.2K ERD-25T J
R515,516 655,656	0B01887A	Carbon Resistor 5.6K ERD-25T J
R518	0B09475A	Metal Film Resistor 316K SN14K2E F
R520	0B09457A	Metal Film Resistor 71.5K SN14K2E F
R521	0B09474A	Metal Film Resistor 280K SN14K2E F
R522,524	0B09453A	Metal Film Resistor 51.1K SN14K2E F
R525,526	0B09305A	Metal Film Resistor 100K SN14K2E F
R528	0B09452A	Metal Film Resistor 49.9K SN14K2E F
R532	0B01846A	Carbon Resistor 4.7K ERD-25T J
R533,538 541,543 563,564 595,612 613,618 624,651 652,658 660,670 684,685	0B01888A	Carbon Resistor 10K ERD-25T J
R534,551 552	0B05668A	Carbon Resistor 82K ERD-25T J
R535,545 553,643 644,676	0B01857A	Carbon Resistor 1K ERD-25T J
R540	0B09217A	Fail Safe Type Resistor 5.6 RDF-25S J
R542,544 546,548 549,550 623,636 637	0B01684A	Carbon Resistor 470K ERD-25T J
R556,615	0B09335A	Carbon Resistor 680K ERD-25T J
R557,559 583-590 592,596 601-605 645,646 672,674	0B05627A	Carbon Resistor 330K ERD-25T J (21 pcs.)
R558	0B09440A	Metal Film Resistor 21.5K SN14K2E F
R560	0B09300A	Metal Film Resistor 150K SN14K2E F
R561	0B09471A	Metal Film Resistor 205K SN14K2E F
R562	0B09438A	Metal Film Resistor 16.5K SN14K2E F
R567,568 570,574	0B05560A	Carbon Resistor 18K ERD-25T J

Schematic Ref. No.	Part No.	Description
R569,577	0B01683A	Carbon Resistor 15K ERD-25T J
R571,573 606,619 626,635	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
R572	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
R575,576 683	0B01681A	Carbon Resistor 3.3K ERD-25T J
R578,579 580,581	0B05626A	Carbon Resistor 150K ERD-25T J
R582,686	0B05784A	Carbon Resistor 560K ERD-25T J
R594,617 620,621 634,657 671	0B05615A	Carbon Resistor 22K ERD-25T J
R610	0B05641A	Carbon Resistor 47K ERD-25T J
R625	0B09263A	Carbon Resistor 12K ERD-25T J
R665	0B01682A	Carbon Resistor 6.8K ERD-25T J
R668,669	0B05621A	Carbon Resistor 120K ERD-25T J
R687	0B05575A	Carbon Resistor 560 ERD-25T J
C101,201 504,508 509,510 522,523 542	0B01405A	Electrolytic Capacitor 1μ 50V
C501	0B01402A	Electrolytic Capacitor 4.7μ 25V
C502,503	0B09147A	Electrolytic Capacitor 3.3μ 25V (LN)
C505	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)
C506,530 531	0B05813A	Mylar Capacitor 0.056μ 50V J
C507	0B01502A	Electrolytic Capacitor 330μ 16V
C511,512 513,514 515	0B05652A	Mylar Capacitor 4700P 50V J
C516,520 521	0B05681A	Mylar Capacitor 0.01μ 50V J
C517,533	0B01780A	Mylar Capacitor 0.1μ 50V J
C518,528 529	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C519	0B09395A	Electrolytic Capacitor 0.68μ 50V (LN)
C524,525	0B01802A	Mylar Capacitor 2200P 50V J
C526,527 534	0B01412A	Electrolytic Capacitor 10μ 16V
C532	0B09332A	Electrolytic Capacitor 2.2μ 25V (LN)
C535,536	0B01400A	Electrolytic Capacitor 100μ 16V
C537	0B09292A	Ceramic Capacitor 0.1μ 50V Z
C538	0B09277A	Ceramic Capacitor 10P 50V J
C539	0B09377A	Electrolytic Capacitor 4700μ 16V
C540,541	0B09285A	Ceramic Capacitor 330P 50V K
SW501,502 504	0B07323A	Rotary Switch 2-3N
SW503,505	0B07325A	Rotary Switch 2-2N
CN29,30	0B08178A	12P-T Post
CN31	0B08644A	8P-T Post
CN32	0B08643A	7P-T Post
CN33	0B08645A	9P-T Post
CN34,35	0B08653A	3P-T Post
CN36	0B08656A	2P-T Post

Schematic Ref. No.	Part No.	Description
	BA04228A	**CPU P.C.B. A Ass'y**
	0B07880B	CPU P.C.B. A
IC301	0B06216A	IC μPD4556C
IC302,706 707,708 709,710	0B06219A	IC μPD4081C
IC303	0B06178A	IC μPD4011C
IC304,713	0B06217A	IC RC4560D
IC305	0B06124B	IC RC4558D
IC701	0B06253A	IC A.B.L.E. CPU μPD546C-113
IC702	0B06265A	IC μPD5101LC
IC703	0B06261A	IC μPD4508BC
IC704,705	0B06260A	IC μPD4516BC
IC711	0B06214A	IC μPD4071C
IC712	0B06143A	IC μPD4001C
Q301,302 701,702 703,704 705	0B06100A	Transistor 2SC945 (A)
Q303	0B06013A	Transistor 2SA733
Q304	0B06070A (0B06299A)	Transistor 2SC1636 (2SC2878)
D701-716 718-730	0B06181A	Silicon Diode 1SS53 (29 pcs.)
L301	0B03919B	Inductor 36mH
VR301,304 701,702	0B07329A	Semi-fixed Volume 2K
VR302,303	0B07270A	Semi-fixed Volume 20K
R301,302 303,304 305	0B09305A	Metal Film Resistor 100K SN14K2E F
R306	0B09472A	Metal Film Resistor 220K SN14K2E F
R307	0B09461A	Metal Film Resistor 90.9K SN14K2E F
R308	0B09455A	Metal Film Resistor 59K SN14K2E F
R309,310 736,737 738,739	0B05508A	Carbon Resistor 56K ERD-25T J
R311	0B09469A	Metal Film Resistor 178K SN14K2E F
R312	0B09458A	Metal Film Resistor 73.2K SN14K2E F
R313	0B09452A	Metal Film Resistor 49.9K SN14K2E F
R314	0B09534A	Metal Film Resistor 12.7K SN14K2E F
R315	0B09460A	Metal Film Resistor 88.7K SN14K2E F
R316,318 319	0B09462A	Metal Film Resistor 95.3K SN14K2E F
R317	0B09427A	Metal Film Resistor 5.62K SN14K2E F
R320	0B01857A	Carbon Resistor 1K ERD-25T J
R321,711 748,749 750,751	0B01888A	Carbon Resistor 10K ERD-25T J
R322,328	0B09447A	Metal Film Resistor 34.8K SN14K2E F
R323,329	0B09424A	Metal Film Resistor 4.75K SN14K2E F
R324	0B09434A	Metal Film Resistor 11.5K SN14K2E F
R325	0B09437A	Metal Film Resistor 15.8K SN14K2E F
R326,332 336	0B09203A	Metal Film Resistor 10K SN14K2E F
R327	0B05641A	Carbon Resistor 47K ERD-25T J
R330	0B09417A	Metal Film Resistor 1.05K SN14K2E F
R331	0B09426A	Metal Film Resistor 5.36K SN14K2E F
R333,337 789,790 791,792 797,798 799,800	0B05615A	Carbon Resistor 22K ERD-25T J

Schematic Ref. No.	Part No.	Description
R334,712	0B09356A	Metal Film Resistor 4.7K SN14K2E F
R335	0B09230A	Metal Film Resistor 1.5K SN14K2E F
R338,717 718,719 768,785 786,787 788,793 794,795 796,802 803,806 807	0B01889A	Carbon Resistor 100K ERD-25T J
R701	0B09522A	Metal Film Resistor 9.53K SN14K2E F
R702	0B09439A	Metal Film Resistor 20K SN14K2E F
R703	0B01679A	Carbon Resistor 100 ERD-25T J
R704	0B09448A	Metal Film Resistor 40.2K SN14K2E F
R705	0B09459A	Metal Film Resistor 80.6K SN14K2E F
R706	0B09467A	Metal Film Resistor 162K SN14K2E F
R707	0B05627A	Carbon Resistor 330K ERD-25T J
R708	0B09335A	Carbon Resistor 680K ERD-25T J
R709	0B05963A	Carbon Resistor 1.3M ERD-25T J
R710	0B09380A	Carbon Resistor 1.5M ERD-25T J
R713	0B09429A	Metal Film Resistor 7.32K SN14K2E F
R714,715	0B09340A	Metal Film Resistor 15K SN14K2E F
R716	0B09263A	Carbon Resistor 12K ERD-25T J
R720,721 722	0B05776A	Carbon Resistor 1M ERD-25T J
R723,724 725,726 727,728	0B05621A	Carbon Resistor 120K ERD-25T J
R729,801	0B05560A	Carbon Resistor 18K ERD-25T J
R730-735 740-747 752-767	0B05675A	Carbon Resistor 3.9K ERD-25T J
R769,770 771,772 781,782 783,784	0B01856A	Carbon Resistor 8.2K ERD-25T J
R773,774 775,776	0B01887A	Carbon Resistor 5.6K ERD-25T J
R777,778 779,780	0B05509A	Carbon Resistor 33K ERD-25T J
R804	0B01854A	Carbon Resistor 39K ERD-25T J
R805	0B05622A	Carbon Resistor 2.2K ERD-25T J
R808	0B05962A	Carbon Resistor 1.2M ERD-25T J
R809	0B05671A	Carbon Resistor 2.2M ERD-25T J
C301	0B09411A	PP Capacitor 3300P 50V G
C302	0B09408A	PP Capacitor 1000P 50V G
C303	0B05950A	PP Capacitor 0.015μ 50V G
C304	0B09409A	PP Capacitor 1800P 50V G
C305,318 320	0B05653A	Mylar Capacitor 1500P 50V J
C306	0B09246A	Mica Capacitor 150P 50V J
C307	0B05813A	Mylar Capacitor 0.056μ 50V J
C308,310 312,313 316	0B05557A	Mylar Capacitor 0.015μ 50V J
C309,311 314,317	0B05550A	Mylar Capacitor 1000P 50V J
C315	0B05652A	Mylar Capacitor 4700P 50V J
C319	0B09275A	Mica Capacitor 200P 50V J
C321	0B09364A	Tantalum Capacitor 0.22μ 35V
C701	0B01400A	Electrolytic Capacitor 100μ 16V
C702,703	0B01397A	Electrolytic Capacitor 1000μ 16V

Schematic Ref. No.	Part No.	Description
C704	0B09290A	Ceramic Capacitor 0.01μ 50V Z
C710	0B05681A	Mylar Capacitor 0.01μ 50V J
C711	0B09395A	Electrolytic Capacitor 0.68μF 50V (LN)
C712	0B01405A	Electrolytic Capacitor 1μ 50V
CN1,3	0B08760A	10P-H Connector 100mm
CN2	0B08761A	11P-H Connector 100mm
CN4	0B08183A	5P-T Post
CN5	0B08302A	7P-T Post B7P-SHF-1
CN6	0B08334A	8P-T Post B8P-SHF-1
CN7	0B08506A	13P-T Post
CN8	0B08182A	6P-T Post
CN9	0B08615A	10P-T Post
CN57	0B08746A	6P-H Connector 930mm

7.20. CPU P.C.B. A Ass'y

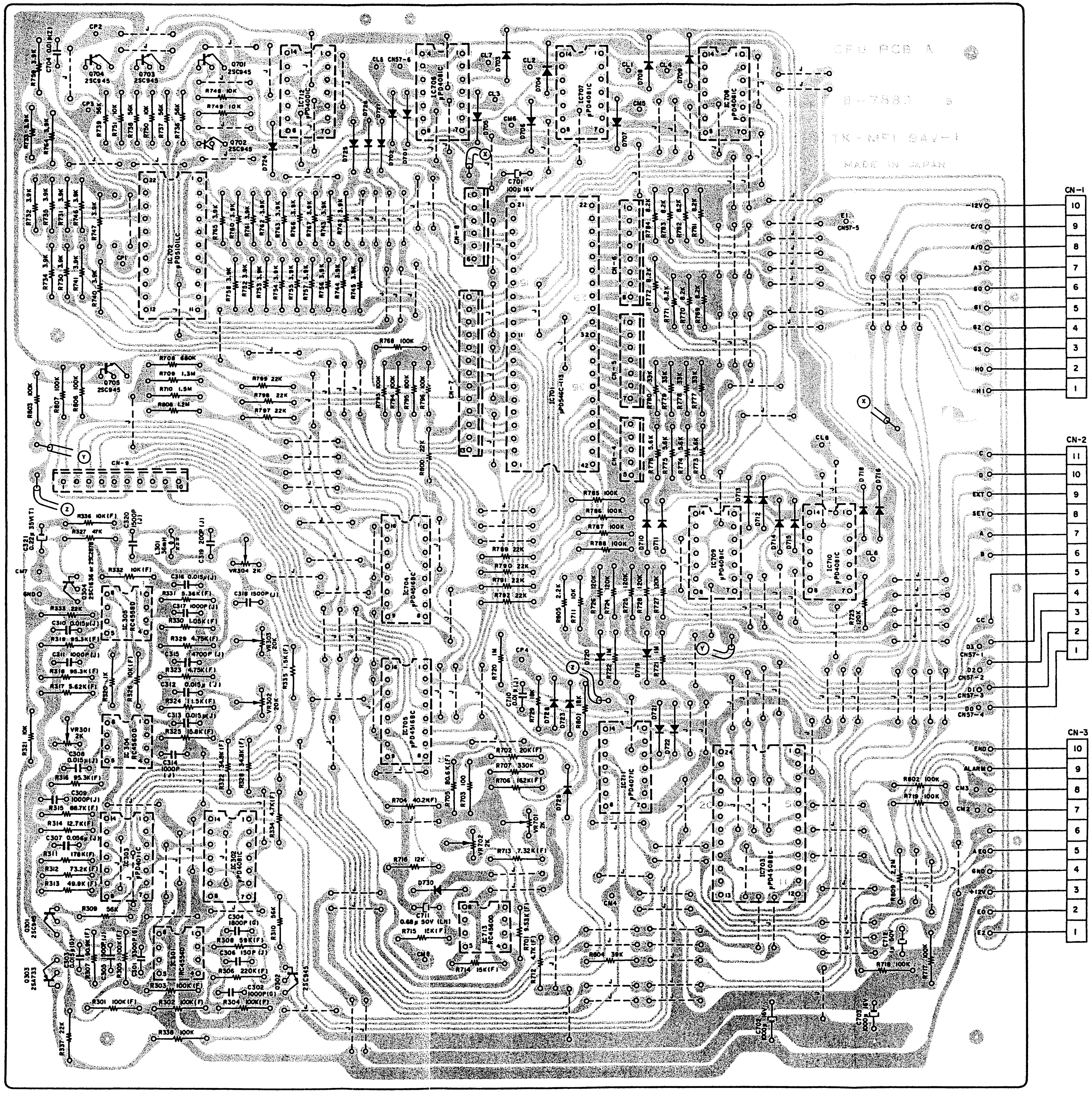


Fig. 7.20

Note: Diode is 1SS53 unless otherwise specified.

7.21. CPU P.C.B. B Ass'y

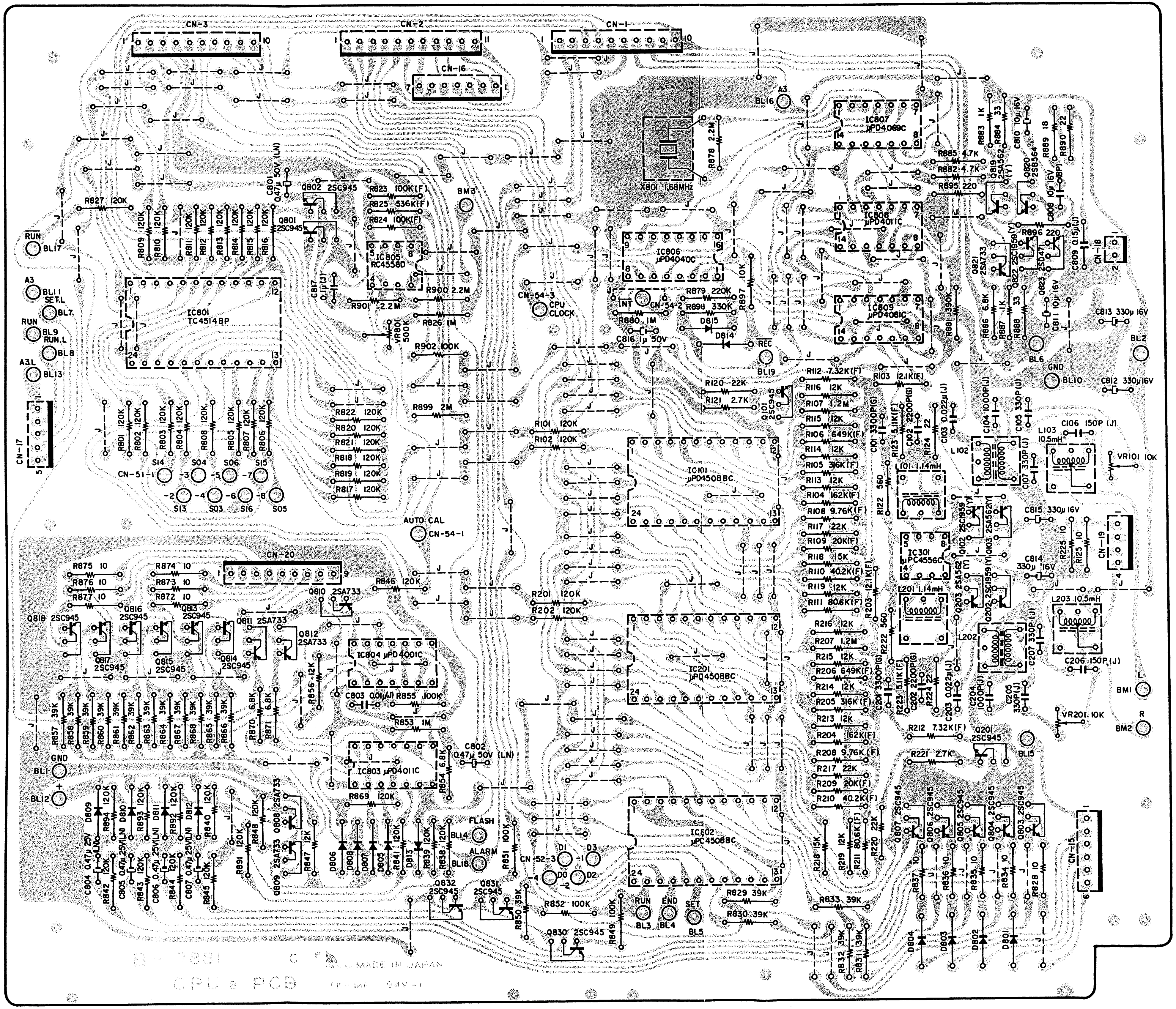
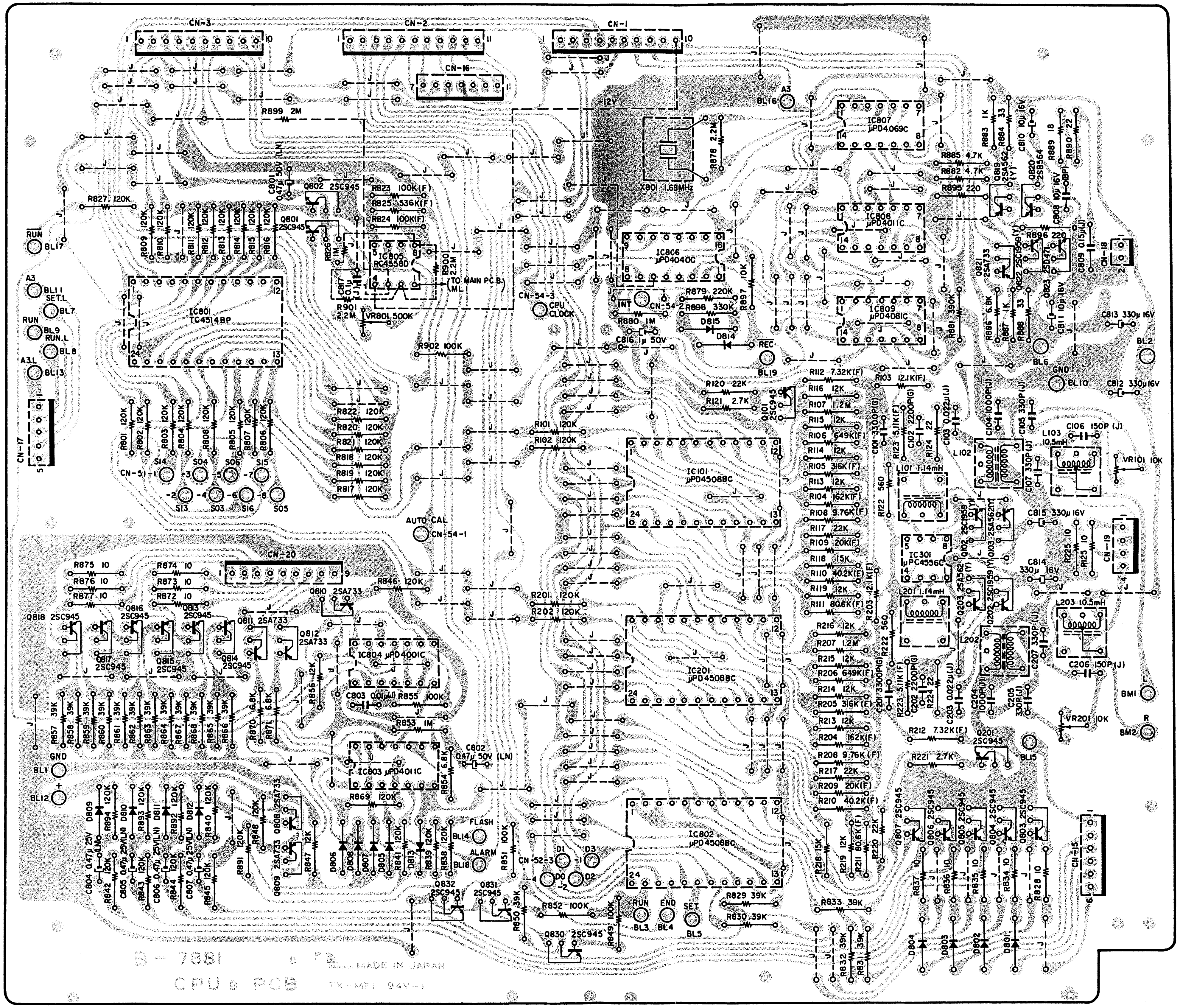

CN-3
CN-2
CN-1
CN-16
IC807 μPD4069C
IC808 μPD4011C
IC809 μPD4081C
IC806 μPD4040C
X801 1.68MHz
IC805 RC4558D
IC801 TC4514BP
IC101 μPD4508BC
IC201 μPD4508BC
IC102 μPC4508BC
IC301 μPC4556C
IC804 μPD4001C
IC803 μPD4011C
Q801 2SC945
Q802 2SC945
Q810 2SA733
Q811 2SA733
Q812 2SA733
Q813 2SC945
Q814 2SC945
Q815 2SC945
Q816 2SC945
Q817 2SC945
Q818 2SC945
Q830 2SC945
Q831 2SC945
Q832 2SC945
Q201 2SC945
L101 1.14mH
L103 10.5mH
L201 1.14mH
L203 10.5mH
VR101 10K
VR201 10K
VR801 500K
CN-17
CN-18
CN-19
CN-20
CN-15
CN-51-1
CN-52-3
CN-54-1
CN-54-2
CN-54-3
CPU CLOCK
AUTO CAL
RUN
BL17
A3
BL11
SET.L
BL7
BL9
RUN.L
BL8
A3L
BL13
GND
BL1
BL12
BL16
BM3
BL19
REC
INT
BL2
BL6
BL10
BM1
BM2
BL15
FLASH
BL14
ALARM
BL18
END
SET
BL3
BL4
BL5
D0
D1
D2
D3
S03
S04
S05
S06
S13
S14
S15
S16
B-7881
CPU B PCB
MADE IN JAPAN

Fig. 7.21.1 3rd Version

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04229A	**CPU P.C.B. B Ass'y** 3rd Version
	0B07881C	CPU P.C.B. B
IC101,201 802	0B06261A	IC μPD4508BC
IC301	0B06216A	IC μPC4556C
IC801	0B06264A	IC TC4514BP
IC803,808	0B06178A	IC μPD4011C
IC804	0B06143A	IC μPD4001C
IC805	0B06124B	IC RC4558D
IC806	0B06223A	IC μPD4040C
IC807	0B06270A	IC μPD4069C
IC809	0B06219A	IC μPD4081C
Q101,201 801-807 813-818 830,831 832	0B06100A	Transistor 2SC945 (A) (18 pcs.)
Q102,202 822	0B06179A	Transistor 2SC1959 (Y)
Q103,203 819	0B06202A	Transistor 2SA562 (Y)
Q808-812 821	0B06013A	Transistor 2SA733 (6 pcs.)
Q820	0B06069A	Transistor 2SB564
Q823	0B06066A	Transistor 2SD471
D801-815	0B06181A	Silicon Diode 1SS53 (15 pcs.)
X801	0B08723A	Crystal 1.68MHz
L101,201	0B01434A	Peaking Coil 1.14mH
L102,202	0B06635A	Bias Coil
L103,203	0B00068A	Trap Coil 10.5mH
VR101,201	0B07256A	Semi-fixed Volume 10K
VR801	0B07330A	Semi-fixed Volume 500K
R101,102 201,202 801-822 827 838-846 848,869 891-894	0B05621A	Carbon Resistor 120K ERD-25T J (42 pcs.)
R103,203	0B09435A	Metal Film Resistor 12.1K SN14K2E F
R104,204	0B09467A	Metal Film Resistor 162K SN14K2E F
R105,205	0B09475A	Metal Film Resistor 316K SN14K2E F
R106,206	0B09482A	Metal Film Resistor 649K SN14K2E F
R107,207	0B05962A	Carbon Resistor 1.2M ERD-25T J
R108,208	0B09535A	Metal Film Resistor 9.76K SN14K2E F
R109,209	0B09439A	Metal Film Resistor 20K SN14K2E F
R110,210	0B09448A	Metal Film Resistor 40.2K SN14K2E F
R111,211	0B09459A	Metal Film Resistor 80.6K SN14K2E F
R112,212	0B09429A	Metal Film Resistor 7.32K SN14K2E F
R113,114 115,116 119,213 214,215 216,219 847,856	0B09263A	Carbon Resistor 12K ERD-25T J
R117,120 217,220	0B05615A	Carbon Resistor 22K ERD-25T J
R118,218	0B01683A	Carbon Resistor 15K ERD-25T J
R121,221	0B05629A	Carbon Resistor 2.7K ERD-25T J
R122,222	0B05575A	Carbon Resistor 560 ERD-25T J
R123,223	0B09425A	Metal Film Resistor 5.11K SN14K2E F
R124,224	0B05579A	Carbon Resistor 22 ERD-25T J
R125,225	0B05936A	Carbon Resistor 10 ERD-25T J
R823,824	0B09305A	Metal Film Resistor 100K SN14K2E F
R825	0B09481A	Metal Film Resistor 536K SN14K2E F
R826,853 880	0B05776A	Carbon Resistor 1M ERD-25T J
R828,834 835,836 837,872 873,874 875,876 877	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
R829-833 850 857-868	0B01854A	Carbon Resistor 39K ERD-25T J (18 pcs.)
R849,851 852,855 902	0B01889A	Carbon Resistor 100K ERD-25T J
R854,870 871,886	0B01682A	Carbon Resistor 6.8K ERD-25T J
R878,900 901	0B05671A	Carbon Resistor 2.2M ERD-25T J
R879	0B05625A	Carbon Resistor 220K ERD-25T J
R881	0B05676A	Carbon Resistor 390K ERD-25T J
R882,885	0B01846A	Carbon Resistor 4.7K ERD-25T J
R883,887	0B01857A	Carbon Resistor 1K ERD-25T J
R884,888	0B01713A	Carbon Resistor 33 ERD-25T J
R889	0B09536A	Fail Safe Type Resistor 18 ERD-14F J
R890	0B09049A	Fail Safe Type Resistor 22 ERD-14F J
R895,896	0B01933A	Carbon Resistor 220 ERD-25T J
R897	0B01888A	Carbon Resistor 10K ERD-25T J
R898	0B05627A	Carbon Resistor 330K ERD-25T J
R899	0B09531A	Carbon Resistor 2M ERD-25T J
C101,201	0B09411A	PP Capacitor 3300P 100V G
C102,202	0B09410A	PP Capacitor 2200P 100V G
C103,203	0B09405A	PP Capacitor 0.022μ 100V G
C104,204	0B09404A	PP Capacitor 1000P 100V J
C105,107 205,207	0B09322A	PP Capacitor 330P 100V J
C106,206	0B09246A	Mica Capacitor 150P 50V J
C801,802 804,805 806,807	0B09222A	Electrolytic Capacitor 0.47μ 50V (LN)
C803	0B05681A	Mylar Capacitor 0.01μ 50V J
C808	0B09163A	Electrolytic Capacitor 10μ 16V (BP)
C809	0B09407A	PP Capacitor 0.15μ 100V J
C810,811	0B01412A	Electrolytic Capacitor 10μ 16V
C812,813 814,815	0B01502A	Electrolytic Capacitor 330μ 16V
C816	0B01405A	Electrolytic Capacitor 1μ 50V
C817	0B01780A	Mylar Capacitor 0.1μ 50V J
CN1,3	0B08646A	10P-T Post
CN2	0B08655A	11P-T Post
CN15	0B08642A	6P-T Post
CN16	0B08643A	7P-T Post
CN17	0B08724A	5P-T Post
CN18	0B08656A	2P-T Post
CN19	0B08654A	4P-T Post
CN20	0B08645A	9P-T Post
CN51	0B08757A	8P-H Connector 250mm
CN52	0B08756A	4P-H Connector 180mm
CN54	0B08758A	3P-H Connector 850mm

Schematic Ref. No.	Part No.	Description
	BA04229A	**CPU P.C.B. B Ass'y** 2nd Version
	0B07881B	CPU P.C.B. B
IC101,201 802	0B06261A	IC μPD4508BC
IC301	0B06216A	IC μPC4556C
IC801	0B06264A	IC TC4514BP
IC803,808	0B06178A	IC μPD4011C
IC804	0B06143A	IC μPD4001C
IC805	0B06124B	IC RC4558D
IC806	0B06223A	IC μPD4040C
IC807	0B06270A	IC μPD4069C
IC809	0B06219A	IC μPD4081C
Q101,201 801-807 813-818 830,831 832	0B06100A	Transistor 2SC945 (A) (18 pcs.)
Q102,202 822	0B06179A	Transistor 2SC1959 (Y)
Q103,203 819	0B06202A	Transistor 2SA562 (Y)
Q808-812 821	0B06013A	Transistor 2SA733 (6 pcs.)
Q820	0B06069A	Transistor 2SB564
Q823	0B06066A	Transistor 2SD471
D801-815	0B06181A	Silicon Diode 1SS53 (15 pcs.)
X801	0B08723A	Crystal 1.68MHz
L101,201	0B01434A	Peaking Coil 1.14mH
L102,202	0B06635A	Bias Coil
L103,203	0B00068A	Trap Coil 10.5mH
VR101,201	0B07256A	Semi-fixed Volume 10K
VR801	0B07330A	Semi-fixed Volume 500K
R101,102 201,202 801-822 827 838-846 848,869 891-894	0B05621A	Carbon Resistor 120K ERD-25T J (42 pcs.)
R103,203	0B09435A	Metal Film Resistor 12.1K SN14K2E F
R104,204	0B09467A	Metal Film Resistor 162K SN14K2E F
R105,205	0B09475A	Metal Film Resistor 316K SN14K2E F
R106,206	0B09482A	Metal Film Resistor 649K SN14K2E F
R107,207	0B05962A	Carbon Resistor 1.2M ERD-25T J
R108,208	0B09535A	Metal Film Resistor 9.76K SN14K2E F
R109,209	0B09439A	Metal Film Resistor 20K SN14K2E F
R110,210	0B09448A	Metal Film Resistor 40.2K SN14K2E F
R111,211	0B09459A	Metal Film Resistor 80.6K SN14K2E F
R112,212	0B09429A	Metal Film Resistor 7.32K SN14K2E F
R113,114 115,116 119,213 214,215 216,219 847,856	0B09263A	Carbon Resistor 12K ERD-25T J
R117,120 217,220	0B05615A	Carbon Resistor 22K ERD-25T J
R118,218	0B01683A	Carbon Resistor 15K ERD-25T J
R121,221	0B05629A	Carbon Resistor 2.7K ERD-25T J
R122,222	0B05575A	Carbon Resistor 560 ERD-25T J
R123,223	0B09425A	Metal Film Resistor 5.11K SN14K2E F
R124,224	0B05579A	Carbon Resistor 22 ERD-25T J
R125,225	0B05936A	Carbon Resistor 10 ERD-25T J
R823,824	0B09305A	Metal Film Resistor 100K SN14K2E F
R825	0B09481A	Metal Film Resistor 536K SN14K2E F
R826,853 880	0B05776A	Carbon Resistor 1M ERD-25T J
R828,834 835,836 837,872 873,874 875,876 877	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
R829-833 850 857-868	0B01854A	Carbon Resistor 39K ERD-25T J (18 pcs.)
R849,851 852,855 902	0B01889A	Carbon Resistor 100K ERD-25T J
R854,870 871,886	0B01682A	Carbon Resistor 6.8K ERD-25T J
R878,900 901	0B05671A	Carbon Resistor 2.2M ERD-25T J
R879	0B05625A	Carbon Resistor 220K ERD-25T J
R881	0B05676A	Carbon Resistor 390K ERD-25T J
R882,885	0B01846A	Carbon Resistor 4.7K ERD-25T J
R883,887	0B01857A	Carbon Resistor 1K ERD-25T J
R884,888	0B01713A	Carbon Resistor 33 ERD-25T J
R889	0B09536A	Fail Safe Type Resistor 18 ERD-14F J
R890	0B09049A	Fail Safe Type Resistor 22 ERD-14F J
R895,896	0B01933A	Carbon Resistor 220 ERD-25T J
R897	0B01888A	Carbon Resistor 10K ERD-25T J
R898	0B05627A	Carbon Resistor 330K ERD-25T J
R899	0B09531A	Carbon Resistor 2M ERD-25T J
C101,201	0B09411A	PP Capacitor 3300P 100V G
C102,202	0B09410A	PP Capacitor 2200P 100V G
C103,203	0B09405A	PP Capacitor 0.022μ 100V G
C104,204	0B09404A	PP Capacitor 1000P 100V J
C105,107 205,207	0B09322A	PP Capacitor 330P 100V J
C106,206	0B09246A	Mica Capacitor 150P 50V J
C801,802 804,805 806,807	0B09222A	Electrolytic Capacitor 0.47μ 50V (LN)
C803	0B05681A	Mylar Capacitor 0.01μ 50V J
C808	0B09163A	Electrolytic Capacitor 10μ 16V (BP)
C809	0B09407A	PP Capacitor 0.15μ 100V J
C810,811	0B01412A	Electrolytic Capacitor 10μ 16V
C812,813 814,815	0B01502A	Electrolytic Capacitor 330μ 16V
C816	0B01405A	Electrolytic Capacitor 1μ 50V
C817	0B01780A	Mylar Capacitor 0.1μ 50V J
CN1,3	0B08646A	10P-T Post
CN2	0B08655A	11P-T Post
CN15	0B08642A	6P-T Post
CN16	0B08643A	7P-T Post
CN17	0B08724A	5P-T Post
CN18	0B08656A	2P-T Post
CN19	0B08654A	4P-T Post
CN20	0B08645A	9P-T Post
CN51	0B08757A	8P-H Connector 250mm
CN52	0B08756A	4P-H Connector 180mm
CN54	0B08758A	3P-H Connector 850mm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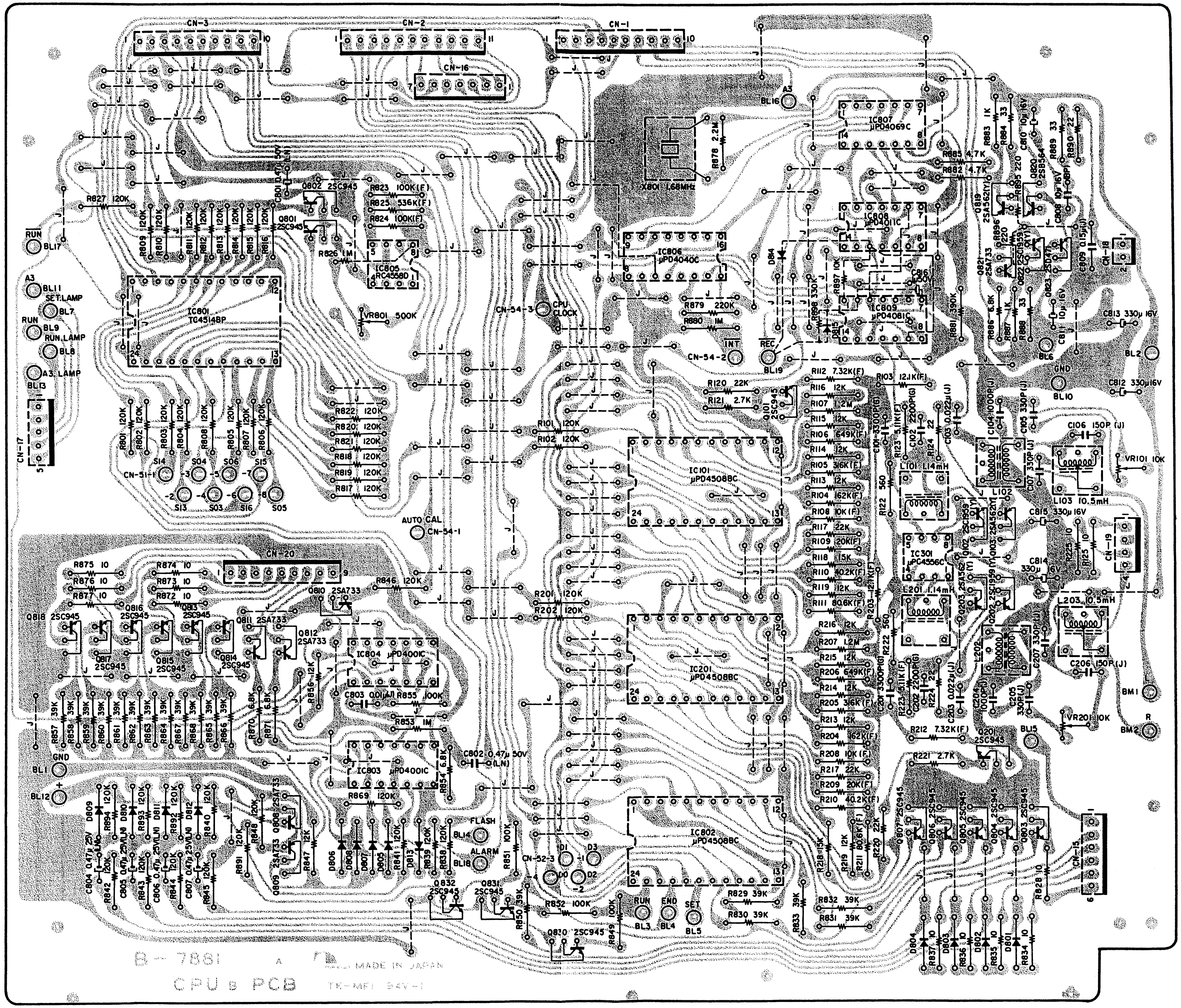
CN-2
CN-1
CN-16
CN-17
CN-18
CN-19
CN-20
CN-15
CN-51
CN-52-3
CN-54-1
CN-54-2
CN-54-3
IC801 TC4514BP
IC805 RC4558D
IC806 μPD4040C
IC807 μPD4069C
IC808 μPD4011C
IC809 μPD4081C
IC101 μPD4508BC
IC201 μPD4508BC
IC802 μPD4508BC
IC803 μPD4011C
IC804 μPD4001C
IC301 μPC4556C
X801 1.69MHz
TO MAIN P.C.B. (ML)
VR801 500K
VR101 10K
VR201 10K
L101 1.14mH
L103 10.5mH
L201 1.14mH
L203 10.5mH
CPU CLOCK
AUTO CAL
INT
REC
FLASH
ALARM
RUN
END
SET
GND
-12V
BM1
BM2
RUN
SET.L
RUN.L
A3
A3.L
B-7881
CPU PCB
MADE IN JAPAN
TK-MFI 94V-1

Fig. 7.21.2 2nd Version

Note: Diode is 1SS53 unless otherwise specified.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CN-2
CN-1
CN-16
IC807 μPD4069C
IC808 μPD4011C
IC806 μPD4040C
IC809 μPD4081C
IC805 RC4558D
IC801 TC4514BP
X801 1.68MHz
IC101 μPD4508BC
IC201 μPD4508BC
IC802 μPD4508BC
IC804 μPD4001C
IC803 μPD4001C
IC301 μPC4556C
CN-20
CN-17
CN-19
CN-15
CN-18
CPU CLOCK
AUTO CAL
FLASH
ALARM
RUN
END
SET
GND
SET LAMP
RUN LAMP
A3 LAMP
VR801 500K
VR101 10K
VR201 10K
L101 1.14mH
L103 10.5mH
L201 1.14mH
L203 10.5mH
B-7881
CPU PCB
MADE IN JAPAN
TK-MF1 94V-1

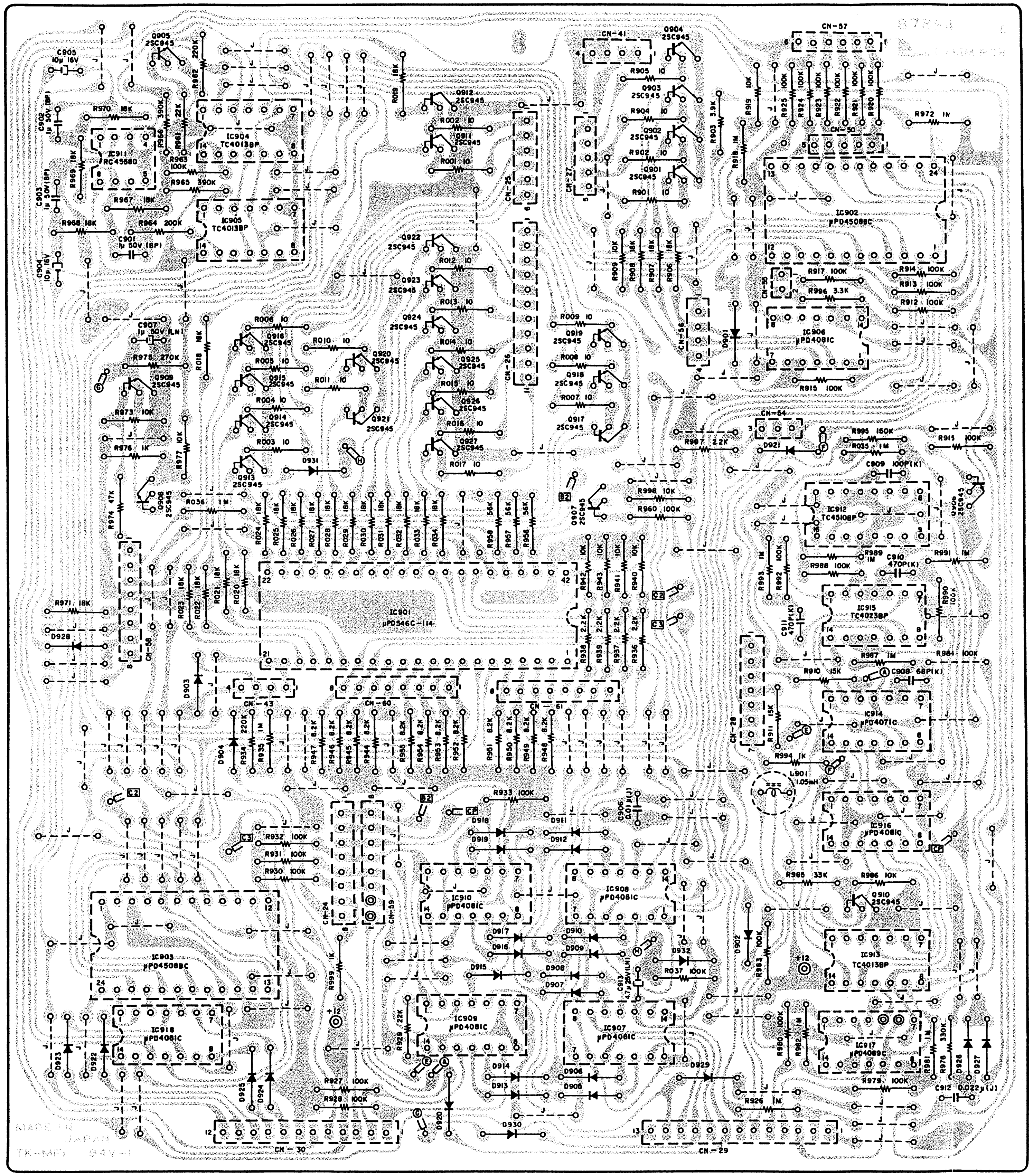
Fig. 7.21. 3 1st Version

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04229A	**CPU P.C.B. B Ass'y** 1st Version
	0B07881A	CPU P.C.B. B
IC101,201 802	0B06261A	IC μPD4508BC
IC301	0B06216A	IC μPC4556C
IC801	0B06264A	IC TC4514BP
IC803,808	0B06178A	IC μPD4011C
IC804	0B06143A	IC μPD4001C
IC805	0B06124B	IC RC4558D
IC806	0B06223A	IC μPD4040C
IC807	0B06270A	IC μPD4069C
IC809	0B06219A	IC μPD4081C
Q101,201 801-807 813-818 830,831 832	0B06100A	Transistor 2SC945 (A) (18 pcs.)
Q102,202 822	0B06179A	Transistor 2SC1959 (Y)
Q103,203 819	0B06202A	Transistor 2SA562 (Y)
Q808-812 821	0B06013A	Transistor 2SA733 (6 pcs.)
Q820	0B06069A	Transistor 2SB564
Q823	0B06066A	Transistor 2SD471
D801-815	0B06181A	Silicon Diode 1SS53 (15 pcs.)
X801	0B08723A	Crystal 1.68MHz
L101,201	0B01434A	Peaking Coil 1.14mH
L102,202	0B06635A	Bias Coil
L103,203	0B00068A	Trap Coil 10.5mH
VR101,201	0B07256A	Semi-fixed Volume 10K
VR801	0B07330A	Semi-fixed Volume 500K
R101,102 201,202 801-822 827 838-846 848,869 891-894	0B05621A	Carbon Resistor 120K ERD-25T J (42 pcs.)
R103,203	0B09435A	Metal Film Resistor 12.1K SN14K2E F
R104,204	0B09467A	Metal Film Resistor 162K SN14K2E F
R105,205	0B09475A	Metal Film Resistor 316K SN14K2E F
R106,206	0B09482A	Metal Film Resistor 649K SN14K2E F
R107,207	0B05962A	Carbon Resistor 1.2M ERD-25T J
R108,208	0B09203A	Metal Film Resistor 10K SN14K2E F
R109,209	0B09439A	Metal Film Resistor 20K SN14K2E F
R110,210	0B09448A	Metal Film Resistor 40.2K SN14K2E F
R111,211	0B09459A	Metal Film Resistor 80.6K SN14K2E F
R112,212	0B09429A	Metal Film Resistor 7.32K SN14K2E F
R113,114 115,116 119,213 214,215 216,219 847,856	0B09263A	Carbon Resistor 12K ERD-25T J
R117,120 217,220	0B05615A	Carbon Resistor 22K ERD-25T J
R118,218	0B01683A	Carbon Resistor 15K ERD-25T J
R121,221	0B05629A	Carbon Resistor 2.7K ERD-25T J
R122,222	0B05575A	Carbon Resistor 560 ERD-25T J
R123,223	0B09425A	Metal Film Resistor 5.11K SN14K2E F
R124,224	0B05579A	Carbon Resistor 22 ERD-25T J
R125,225	0B05936A	Carbon Resistor 10 ERD-25T J
R823,824	0B09305A	Metal Film Resistor 100K SN14K2E F
R825	0B09481A	Metal Film Resistor 536K SN14K2E F
R826,853 880	0B05776A	Carbon Resistor 1M ERD-25T J
R828,834 835,836 837,872 873,874 875,876 877	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
R829-833 850 857-868	0B01854A	Carbon Resistor 39K ERD-25T J (18 pcs.)
R849,851 852,855	0B01889A	Carbon Resistor 100K ERD-25T J
R854,870 871,886	0B01682A	Carbon Resistor 6.8K ERD-25T J
R878	0B05671A	Carbon Resistor 2.2M ERD-25T J
R879	0B05625A	Carbon Resistor 220K ERD-25T J
R881	0B05676A	Carbon Resistor 390K ERD-25T J
R882,885	0B01846A	Carbon Resistor 4.7K ERD-25T J
R883,887	0B01857A	Carbon Resistor 1K ERD-25T J
R884,888 889	0B01713A	Carbon Resistor 33 ERD-25T J
R890	0B09049A	Fail Safe Type Resistor 22 ERD-14F J
R895,896	0B01933A	Carbon Resistor 220 ERD-25T J
R897	0B01888A	Carbon Resistor 10K ERD-25T J
R898	0B05627A	Carbon Resistor 330K ERD-25T J
C101,201	0B09411A	PP Capacitor 3300P 100V G
C102,202	0B09410A	PP Capacitor 2200P 100V G
C103,203	0B09405A	PP Capacitor 0.022μ 100V G
C104,204	0B09404A	PP Capacitor 1000P 100V J
C105,107 205,207	0B09322A	PP Capacitor 330P 100V J
C106,206	0B09246A	Mica Capacitor 150P 50V J
C801,802 804,805 806,807	0B09222A	Electrolytic Capacitor 0.47μ 50V (LN)
C803	0B05681A	Mylar Capacitor 0.01μ 50V J
C808	0B09163A	Electrolytic Capacitor 10μ 16V (BP)
C809	0B09407A	PP Capacitor 0.15μ 100V J
C810,811	0B01412A	Electrolytic Capacitor 10μ 16V
C812,813 814,815	0B01502A	Electrolytic Capacitor 330μ 16V
C816	0B01405A	Electrolytic Capacitor 1μ 50V
CN1,3	0B08646A	10P-T Post
CN2	0B08655A	11P-T Post
CN15	0B08642A	6P-T Post
CN16	0B08643A	7P-T Post
CN17	0B08724A	5P-T Post
CN18	0B08656A	2P-T Post
CN19	0B08654A	4P-T Post
CN20	0B08645A	9P-T Post
CN51	0B08757A	8P-H Connector 250mm
CN52	0B08756A	4P-H Connector 180mm
CN54	0B08758A	3P-H Connector 850mm

Schematic Ref. No.	Part No.	Description
	BA04226A	**RAMM P.C.B. Ass'y**
	0B07894D	RAMM P.C.B.
IC901	0B06245A	IC RAMM CPU μPD546C-114
IC902,903	0B06261A	IC μPD4508BC
IC904,905 913	0B06213A	IC TC4013BP
IC906-910 916,918	0B06219A	IC μPD4081C
IC911	0B06124B	IC RC4558D
IC912	0B06212A	IC TC4510BP
IC914	0B06214A	IC μPD4071C
IC915	0B06224A	IC TC4023BP
IC917	0B06270A	IC μPD4069C
Q901-927	0B06100A	Transistor 2SC945 (A) (27 pcs.)
D901-932	0B06181A	Silicon Diode 1SS53 (32 pcs.)
L901	0B06636A	Inductor 1.05mH
R901,902 904,905 001-017	0B09216A	Fail Safe Type Resistor 10 RDF-25S J (21 pcs.)
R903	0B05675A	Carbon Resistor 3.9K ERD-25T J
R906-908 967-971 018-034	0B05560A	Carbon Resistor 18K ERD-25T J (25 pcs.)
R909,919 940,941 942,943 973,977 986,998	0B01888A	Carbon Resistor 10K ERD-25T J
R910,911	0B01683A	Carbon Resistor 15K ERD-25T J
R912-917 920-925 927,928 930-933 960,963 979,980 983,984 988,990 992,037	0B01889A	Carbon Resistor 100K ERD-25T J (28 pcs.)
R918,926 935,972 981,982 987,989 991,993 035,036	0B05776A	Carbon Resistor 1M ERD-25T J
R929,961	0B05615A	Carbon Resistor 22K ERD-25T J
R934,962	0B05625A	Carbon Resistor 220K ERD-25T J
R936,937 938,939 997	0B05622A	Carbon Resistor 2.2K ERD-25T J
R944-955 035,036	0B01856A	Carbon Resistor 8.2K ERD-25T J (12 pcs.)
R956,957 958	0B05508A	Carbon Resistor 56K ERD-25T J
R964	0B09392A	Carbon Resistor 200K ERD-25T J
R965,966	0B05676A	Carbon Resistor 390K ERD-25T J
R974	0B05641A	Carbon Resistor 47K ERD-25T J
R975	0B05620A	Carbon Resistor 270K ERD-25T J
R976,994 999	0B01857A	Carbon Resistor 1K ERD-25T J
R978	0B05627A	Carbon Resistor 330K ERD-25T J
R985	0B05509A	Carbon Resistor 33K ERD-25T J
R995	0B05626A	Carbon Resistor 150K ERD-25T J
R996	0B01681A	Carbon Resistor 3.3K ERD-25T J
C901,902 903	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C904,905	0B01412A	Electrolytic Capacitor 10μ 16V
C906	0B05681A	Mylar Capacitor 0.01μ 50V J
C907	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C908	0B09393A	Ceramic Capacitor 68P 50V K
C909	0B09282A	Ceramic Capacitor 100P 50V K
C910,911	0B09286A	Ceramic Capacitor 470P 50V K
C912	0B05582A	Mylar Capacitor 0.022μ 50V J
C913	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)
CN24,58 59	0B08644A	8P-T Post
CN25,57	0B08642A	6P-T Post
CN26	0B08655A	11P-T Post
CN27	0B08724A	5P-T Post
CN28	0B08643A	7P-T Post
CN29,30	0B08732A	12P-S Connector F12P-SHVQ
CN41,56	0B08654A	4P-T Post
CN43	0B08236A	4P-T Post B4P-SHF-1
CN50	0B08183A	5P-T Post B5P-SHF-1
CN54	0B08653A	3P-T Post
CN55	0B08656A	2P-T Post
CN60,61	0B08334A	8P-T Post B8P-SHF-1

7.22. RAMM P.C.B. Ass'y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IC904 TC4013BP
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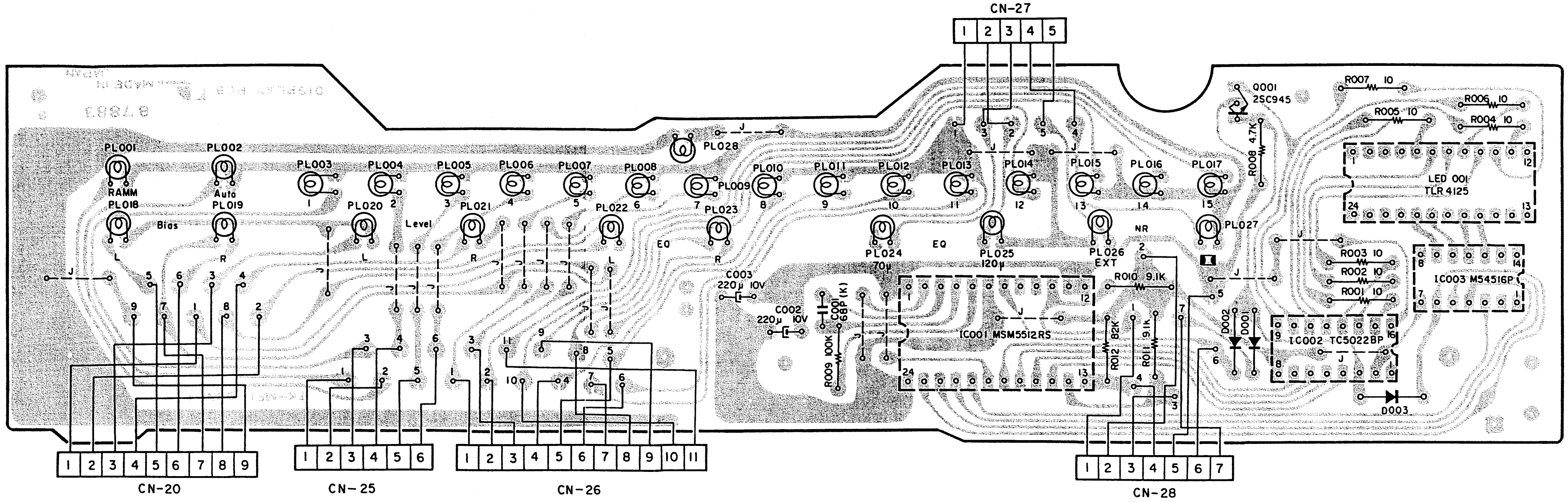
CN-54
CN-58
CN-43
CN-60
CN-61
CN-28
CN-24
CN-59
CN-30
CN-29
L901 1.05mH

Fig. 7.22

Note: Diode is 1SS53 unless otherwise specified.

7.23. Display P.C.B. Ass'y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PL002
RAMM
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PL018
PL019
Bias
PL003
PL004
PL005
PL006
PL007
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PL021
PL022
PL028
PL009
PL023
EQ
PL010
PL011
PL012
PL013
PL014
PL015
PL016
PL017
PL024
70μ
PL025
120μ
PL026
EXT
NR
PL027
Q001
2SC945
R008 4.7K
R007 10
R006 10
R005 10
R004 10
LED 001
TLR 4125
R003 10
R002 10
R001 10
IC003 M54516P
R010 9.1K
C003
220μ 10V
C002
220μ 10V
C001 68P (K)
R009 100K
IC001 MSM5512RS
R012 82K
R011 9.1K
D002
D001
IC002 TC5022BP
D003
CN-20
CN-25
CN-26
CN-28

Fig. 7.23

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04233A	**Display P.C.B. Ass'y**
	0B07883B	Display P.C.B.
IC001	0B06259A	IC MSM5512RS
IC002	0B06211A	IC TC5022BP
IC003	0B06258A	IC M54516P
Q001	0B06100A	Transistor 2SC945 (A)
D001,002 003	0B06181A	Silicon Diode 1SS53
LED001	0B06266A	LED TLR4125
R001-007	0B05936A	Carbon Resistor 10 ERD-25T J (7 pcs.)
R008	0B01846A	Carbon Resistor 4.7K ERD-25T J
R009	0B01889A	Carbon Resistor 100K ERD-25T J
R010,011	0B05694A	Carbon Resistor 9.1K ERD-25T J
R012	0B05668A	Carbon Resistor 82K ERD-25T J
C001	0B09393A	Ceramic Capacitor 68P 50V K
C002,003	0B05899A	Electrolytic Capacitor 220μ 10V
PL001-027	0B08721A	Lamp 12V 30mA (27 pcs.)
PL028	0B08822A	Lamp 14V 60mA
CN20	0B08741A	9P-H Connector 550mm
CN25	0B08740A	6P-H Connector 340mm
CN26	0B08742A	11P-H Connector 360mm
CN27	0B08738A	5P-H Connector 390mm
CN28	0B08739A	7P-H Connector 420mm
	0B08772A	Filter Cap (1 pce.)

8. MECHANISM ASS'Y AND PARTS LIST

8.1. Synthesis

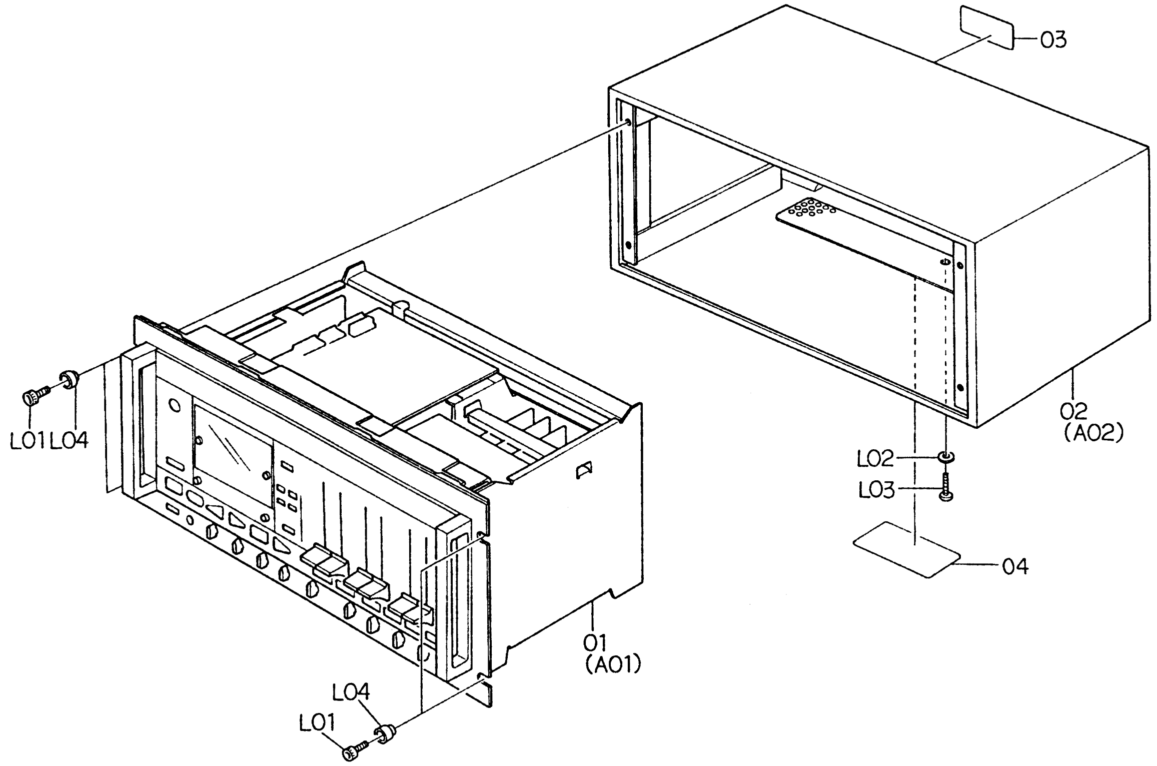


Fig. 8.1

Schematic Ref. No.	Part No.	Description	Q'ty
		Synthesis	
		Serial No.: A11701001–	
01	HA04008A	Synthesis Mechanism Ass'y (U.S.A. & Canada)	1
	HA04025A	Synthesis Mechanism Ass'y (Japan)	1
	HA04026A	Synthesis Mechanism Ass'y (Others)	1
	HA04027A	Synthesis Mechanism Ass'y (220V Class 2)	1
	HA04028A	Synthesis Mechanism Ass'y (UK)	1
	HA04029A	Synthesis Mechanism Ass'y (Australia)	1
02	HA04000A	Cabinet Ass'y	1
03	0M03458A	PASS Label	1
04	0M04101A	Caution Label	1
L01	0E00932A	Screw M5x10 Hex. Socket Head (Black Chromate)	4
L02	0E00930A	Washer 5mm (Black Chromate)	1
L03	0E00931A	Screw M4x18 Philips Binding Head (Bronze)	1
L04	0H03847A	Set Washer	4

8.2. Synthesis Mechanism Ass'y (A01)

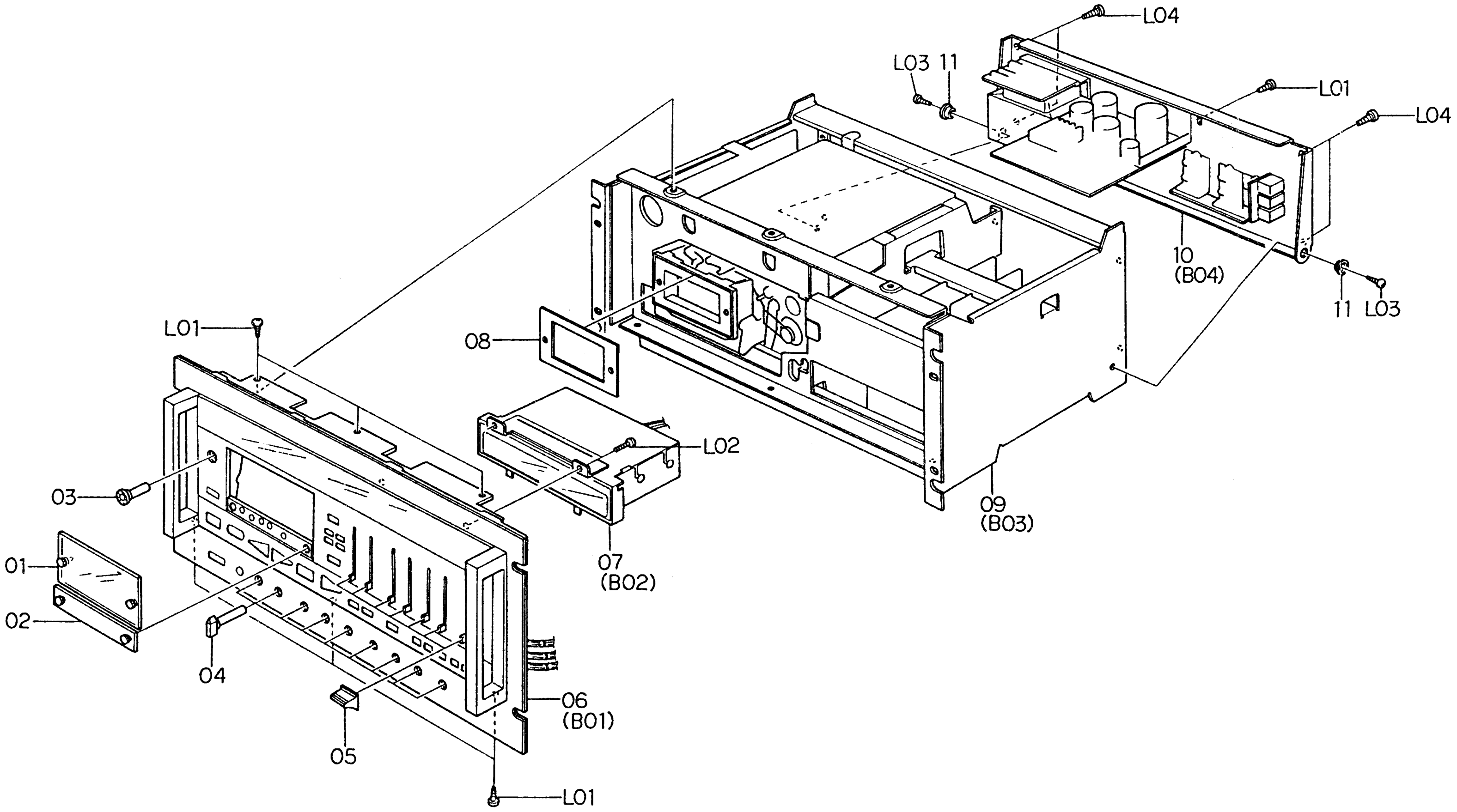


Fig. 8.2

Schematic Ref. No.	Part No.	Description	Q'ty
A01	**HA04008A**	**Synthesis Mechanism Ass'y (U.S.A. & Canada)**	**1**
	HA04025A	**Synthesis Mechanism Ass'y (Japan)**	**1**
	HA04026A	**Synthesis Mechanism Ass'y (Others)**	**1**
	HA04027A	**Synthesis Mechanism Ass'y (220V Class 2)**	**1**
	HA04028A	**Synthesis Mechanism Ass'y (UK)**	**1**
	HA04029A	**Synthesis Mechanism Ass'y (Australia)**	**1**
		Serial No.: A11701001–	
01	HA04001A	Cassette Case Cover Ass'y	1
02	HA03981A	Azimuth Alignment Cover Ass'y	1
03	0H03846A	Pitch Control Knob	1
04	0H03860A	Function Switch Knob	9
05	0H03844A	Slide Volume Knob	3
06	HA04009A	Front Panel Ass'y	1
07	HA04011A	FL Indicator Ass'y	1
08	0H03838A	Cassette Case Plate	1
09	HA04012A	Synthesis Mechanism Sub Ass'y (U.S.A. & Canada)	1
	HA04030A	Synthesis Mechanism Sub Ass'y (Japan)	1
	HA04031A	Synthesis Mechanism Sub Ass'y (220V Class 2, UK, Australia & Others)	1
10	HA04010A	Rear Panel Ass'y (U.S.A. & Canada)	1
	HA04035A	Rear Panel Ass'y (Japan)	1
	HA04036A	Rear Panel Ass'y (Others)	1
	HA04037A	Rear Panel Ass'y (220V Class 2)	1
	HA04038A	Rear Panel Ass'y (UK)	1
	HA04039A	Rear Panel Ass'y (Australia)	1
11	0J04154A	Rear Panel Collar	2
–	0B08515A	Insh-Lock	5
L01	0E00860A	BT Screw M3x6 Philips Binding Head (Black Chromate)	7
L02	0E00521A	Screw M3x8 Philips Pan Head	2
L03	0E00857A	BT Screw M3x6 Philips Binding Head	2
L04	0E00858A	BT Screw M4x6 Philips Binding Head (Bronze)	4

8.3. Cabinet Ass'y (A02)

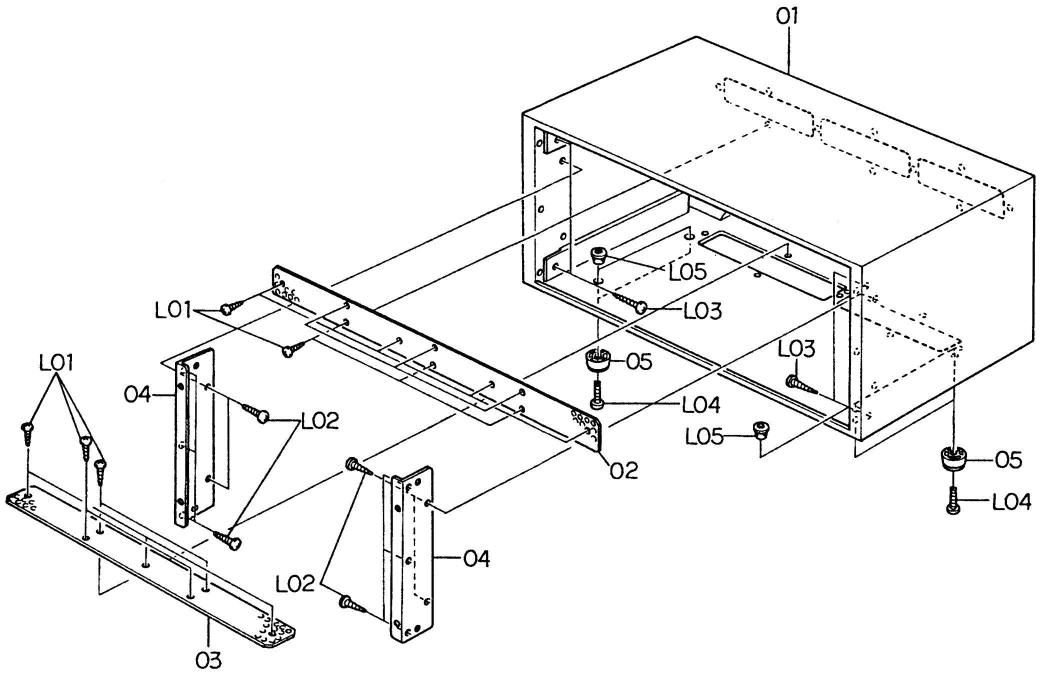

01
L05
L03
L01
L01
04
L02
02
05
L04
L03
L05
05
L04
L02
04
03

Fig. 8.3

8.4. Front Panel Ass'y (B01)

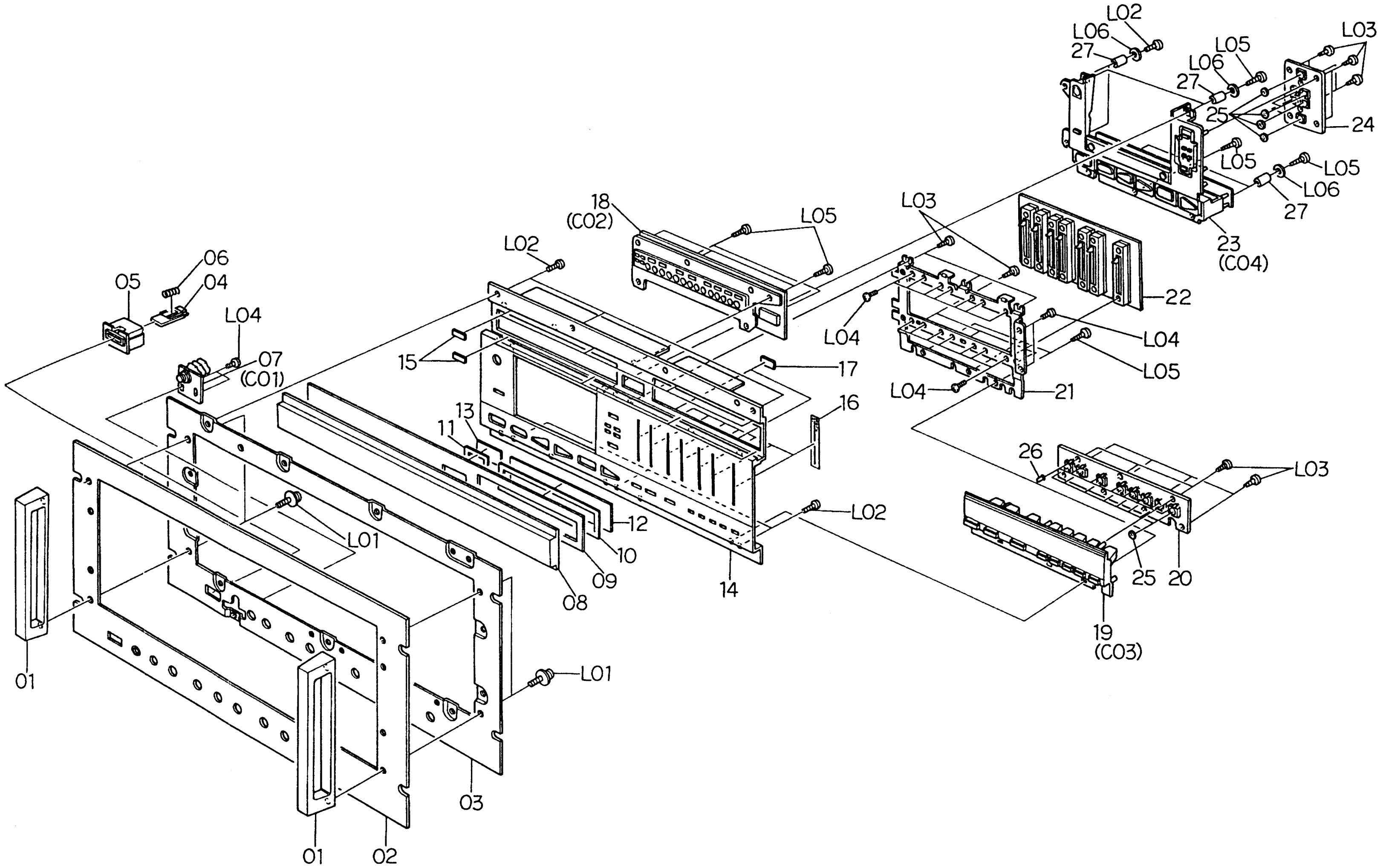

L02
L06
27
L05
L06
27
25
L03
24
L05
L05
L06
27
23
(C04)
18
(C02)
L02
L05
L03
22
05
06
04
L04
07
(C01)
15
17
L04
L04
L05
16
L04
21
13
11
26
L03
12
L02
L01
10
09
08
14
25
20
19
(C03)
L01
01
01
02
03

Fig. 8.4

Schematic Ref. No.	Part No.	Description	Q'ty
A02	**HA04000A**	**Cabinet Ass'y** Serial No.: A11701001–	1
01	0A03286A	Cabinet	1
02	0H03878A	Punching Plate A	1
03	0H03879A	Punching Plate B	1
04	0H03880A	Cabinet Side Plate	2
05	0J03825A	Leg S	4
L01	0E01022A	Wood Screw 2.7x8 Philips Round Head	17
L02	0E01023A	Wood Screw 3.1x13 Philips Round Head	10
L03	0E01024A	Wood Screw 3.1x25 Philips Round Head	4
L04	0E00937A	Screw M4x16 Philips Pan Head (Black Chromate)	4
L05	0E01025A	Nut 4mm (Self Tightened)	4

Schematic Ref. No.	Part No.	Description	Q'ty
B01	**HA04009A**	**Front Panel Ass'y** Serial No.: A11701001–	1
01	0H03867A	Handle	2
02	0H03871A	Front Panel B	1
03	0J04121A	Panel Chassis	1
04	0H03863A	Power Switch Button	1
05	0H03864A	Power Switch Escutcheon	1
06	0J04114A	Power Switch Spring	1
07	JA03737A	Headphone Jack Ass'y	1
08	0H03870A	Indicator Cover	1
09	0H03869B	Indicator Plate	1
10	0J04288A	Adhesive Tape A	1
11	0J04289B	Adhesive Tape B	1
12	0H03842A	FL Indicator Filter	1
13	0H03856B	Counter Filter	1
14	0H03875B	Front Panel	1
15	0J04112B	Indicator Cushion	8
16	0J04128A	Volume Cover	7
17	0J04129A	FL Indicator Cushion	2
18	HA04018A	Display House Ass'y	1
19	HA04016A	Front Escutcheon B Ass'y	1
20	BA04240A	Function P.C.B. Ass'y	1
21	0J04118A	Volume Holder	1
22	BA04232A	MIC Amp. & Volume P.C.B. Ass'y	1
23	HA04015A	Front Escutcheon A Ass'y	1
24	BA04241A	RAMM Control Switch P.C.B. Ass'y	1
25	0J04290B	Switch Cushion	14
26	0B08847A	Filter Cap G-50	8
27	0J04329A	Front Escutcheon Collar	6
L01	0E00933A	Screw M4x12 Philips Pan Head (3A)	4
L02	0E00589A	Screw M3x6 Philips Pan Head	18
L03	0E00857A	BT Screw M3x6 Philips Binding Head	19
L04	0E00502A	Screw M3x5 Philips Pan Head	18
L05	0E00868A	BT Screw M3x8 Philips Binding Head	13
L06	0E00178A	Washer 3mm	6

8.5. FL Indicator Ass'y (B02)

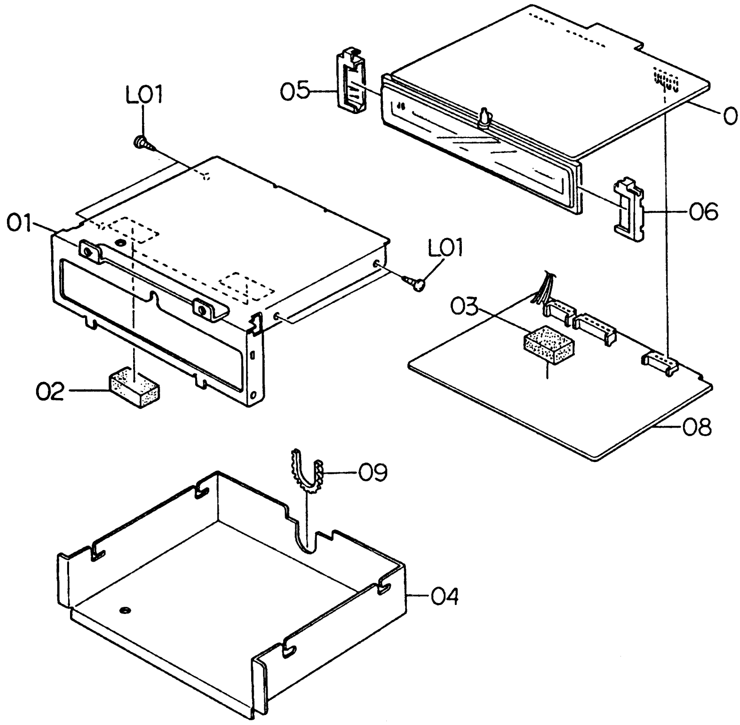


Fig. 8.5

8.6. Synthesis Mechanism Sub Ass'y (B03)

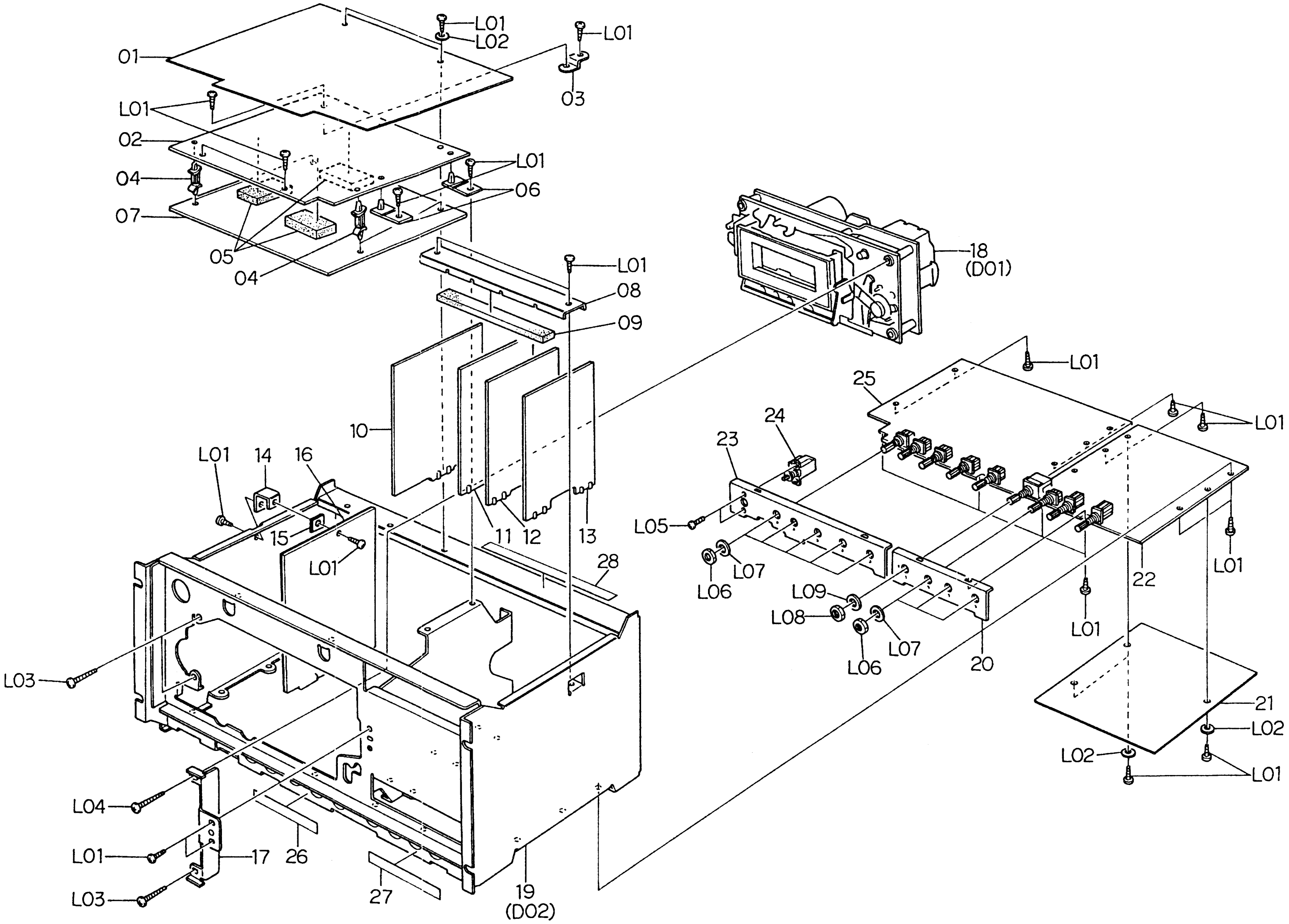


Fig. 8.6

Schematic Ref. No.	Part No.	Description	Q'ty
B02	**HA04011A**	**FL Indicator Ass'y** Serial No.: A11701001–	1
01	JA03683A	FL Indicator Case Ass'y	1
02	0J04263B	Cushion B	2
03	0J04262B	Cushion A	1
04	0J04127A	FL Indicator Case Cover	1
05	0J04119A	FL Indicator Holder L	1
06	0J04120A	FL Indicator Holder R	1
07	BA04246A	FL Indicator P.C.B. B Ass'y	1
08	BA04245A	FL Indicator P.C.B. A Ass'y	1
09	0B08776A	Free Bushing 36mm	1
L01	0E00857A	BT Screw M3x6 Philips Binding Head	4
B03	**HA04012A**	**Synthesis Mechanism Sub Ass'y** Serial No.: A11701001–	1
01	0B08824B	CPU P.C.B. Shield Plate	1
02	BA04229A	CPU P.C.B. B Ass'y	1
03	0J04153A	P.C.B. Holder C	1
04	0J04255A	P.C.B. Supporter	4
05	0J04262A	Cushion A	3
06	0B08771A	Hinge	2
07	BA04228A	CPU P.C.B. A Ass'y	1
08	0J04152A	P.C.B. Holder B	1
09	0J04155B	P.C.B. Cushion	1
10	BA04231A	Record Eq. Amp. P.C.B. Ass'y	1
11	BA04230A	Detector P.C.B. Ass'y	1
12	BA04236A	Record Dolby NR P.C.B. Ass'y	1
13	BA04235A	Playback Amp. & Dolby NR P.C.B. Ass'y	1
14	0J04151B	P.C.B. Holder A	1
15	0J04264A	Insulator	1
16	BA04226A	RAMM P.C.B. Ass'y	1
17	0J04135C	Mechanism Bracket	1
18	CA08243B	Mechanism Ass'y 1000ZXL	1
19	JA03734A	Chassis Sub Ass'y	1
20	0J04146A	Switch Plate MB	1
21	0B08825A	Main P.C.B. Insulator	1
22	BA04227A	Main P.C.B. Ass'y	1
23	0J04145A	Switch Plate LB	1
24	0B07253A	Power Switch	1
	0B07271A	Power Switch	1
	0B07252A	Power Switch	1
25	BA04244B	Logic P.C.B. Ass'y	1
26	0M04178A	Function Switch Seal L	1
27	0M04177A	Function Switch Seal R	1
28	0M04179A	Module P.C.B. Indicator Label	1
–	0M04170A	Amplifier Serial No. Seal	1
–	0B08515A	Insh-Lock	30
L01	0E00857A	BT Screw M3x6 Philips Binding Head	28
L02	0E00178A	Washer 3mm	5
L03	0E00944A	BT Screw M4x15 Philips Binding Head (Block Chromate)	3
L04	0E00924A	BT Screw M4x16 Philips Binding Head	1
L05	0E00502A	Screw M3x5 Philips Pan Head	2
L06	–	Switch Nut A	(8)
L07	–	Switch Washer A	(8)
L08	–	Switch Nut B	(1)
L09	–	Switch Washer B	(1)

8.7. Rear Panel Ass'y (B04)

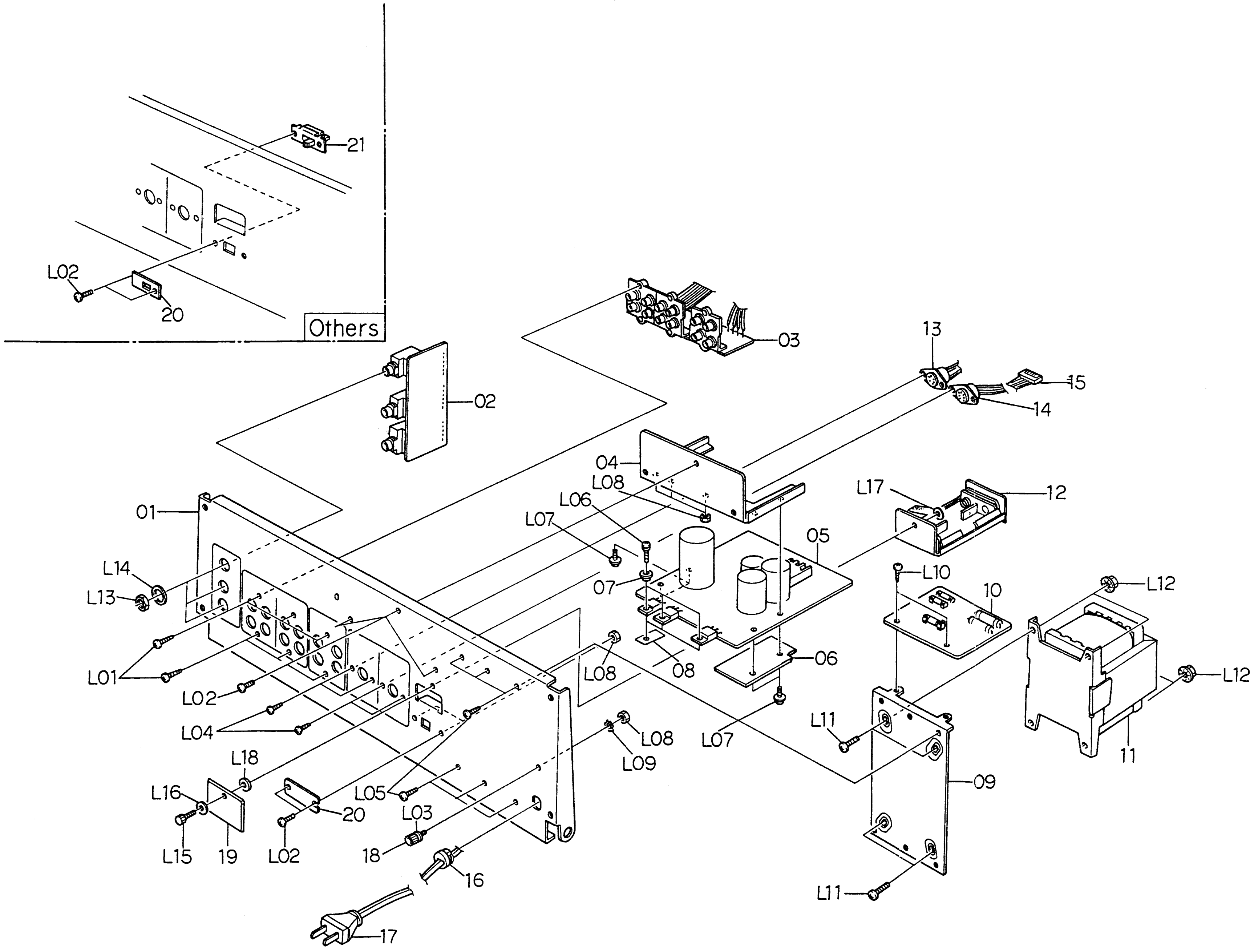

Others
21
L02
20
03
02
13
15
14
04
L08
L06
L07
L17
12
01
05
L14
L13
07
L10
10
L12
L01
08
06
L08
L02
L04
L11
L07
L08
L09
L18
11
L12
09
L16
L05
L03
20
L15
19
L02
18
16
L11
17

Fig. 8.7

8.8. Headphone Jack Ass'y (C01)

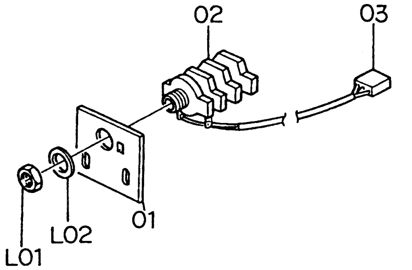

02
03
L01
L02
01

Fig. 8.8

8.9. Display House Ass'y (C02)

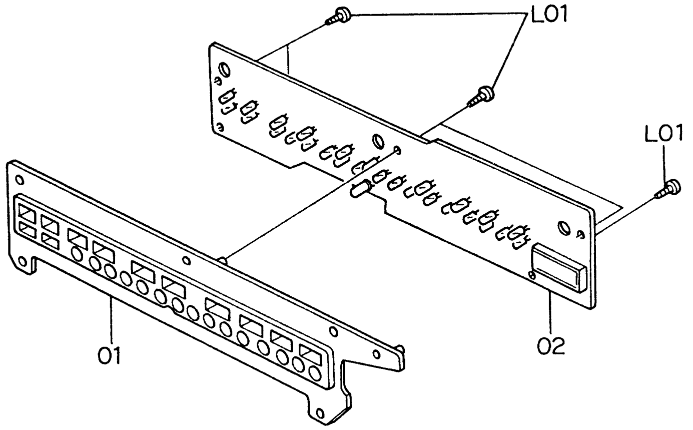

L01
L01
01
02

Fig. 8.9

8.10. Front Escutcheon B Ass'y (C03)

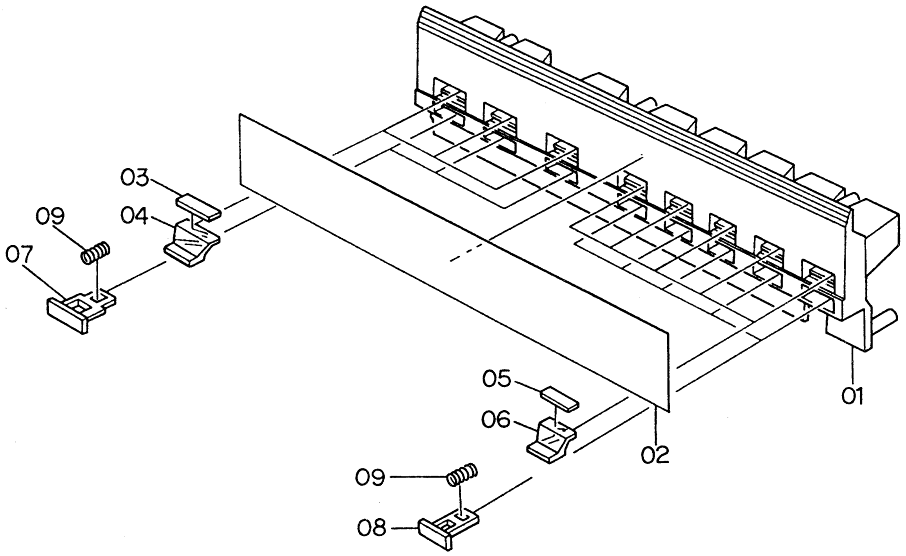

03
09
04
07
05
06
09
08
02
01

Fig. 8.10

Schematic Ref. No.	Part No.	Description	Q'ty
B04	**HA04010A**	**Rear Panel Ass'y (U.S.A. & Canada)**	**1**
	HA04035A	**Rear Panel Ass'y (Japan)**	**1**
	HA04036A	**Rear Panel Ass'y (Others)**	**1**
	HA04037A	**Rear Panel Ass'y (220V Class 2)**	**1**
	HA04038A	**Rear Panel Ass'y (UK)**	**1**
	HA04039A	**Rear Panel Ass'y (Australia)**	**1**
		Serial No.: A11701001–	
01	0H03881D	Rear Panel	1
02	BA04243A	MIC Jack P.C.B. Ass'y	1
03	BA04242A	Pin Jack P.C.B. Ass'y	1
04	0B08759C	Heat Sink	1
05	BA04234A	Power Supply P.C.B. Ass'y	1
06	0B08826B	Insulator	1
07	0B08602A	Transistor Bushing TO220	3
08	0B08601A	Insulator Mica TO220	3
09	0J04147B	Transformer Holder	1
10	BA04256A	Fuse P.C.B. Ass'y (U.S.A., Canada & Others)	1
	BA04257A	Fuse P.C.B. Ass'y (Japan)	1
	BA04259A	Fuse P.C.B. Ass'y (220V Class 2)	1
	BA04258A	Fuse P.C.B. Ass'y (UK & Australia)	1
11	0B06630A	Power Transformer (U.S.A. & Canada)	1
	0B06631A	Power Transformer (Japan)	1
	0B06633A	Power Transformer (Others)	1
	0B06632A	Power Transformer (220V Class 2, UK & Australia)	1
12	JA03733A	Battery Box Ass'y	1
13	0B08584A	8P DIN Socket	1
14	0B08495A	8P DIN Socket	1
15	0B08770A	8P-H Connector	1
16	0B08037U	Cord Bushing (U.S.A., Canada, 220V Class 2, Others, Australia & Japan)	1
	0B08351A	Cord Bushing (UK)	1
17	0B08533A	Power Cord (U.S.A., Canada & Others)	1
	0B08219B	Power Cord (Japan)	1
	0B08093U	Power Cord (220V Class 2)	1
	0B08348A	Power Cord (UK)	1
	0B05241A	Power Cord (Australia)	1
18	0B03920B	Ground Terminal	1
19	0H03882A	Battery Cover	1
20	0J03663C	Switch Cover C (U.S.A., Canada, 220V Class 2, Australia & Japan)	1
	0M03946A	Voltage Lock Plate (Others)	1
21	0B07092U	Voltage Selector	1
–	0M03955A	Voltage Label B (Others)	1
–	0M03794A	Voltage Label 100V (Japan)	1
–	0M03796A	Voltage Label 220V (220V Class 2)	1
–	0M03797A	Voltage Label 240V (UK & Australia)	1
–	0M03798A	Nakamichi Label (Japan)	1
–	0M03844B	Power Cord Label (UK)	1
–	0F01071A	Free-Up Belt	1
–	0M04203A	ABLE Level (U.S.A.)	1

Schematic Ref. No.	Part No.	Description	Q'ty
L01	0E00921A	BT Screw M3x8 Philips Binding Head (Black Chromate)	6
L02	0E00593A	Screw M3x6 Philips Binding Head	5
L03	0E00732A	Washer 3mm	1
L04	0E00714A	Screw M2.6x6 Philips Binding Head (Bronze)	4
L05	0E00860A	BT Screw M3x6 Philips Binding Head (Bronze)	6
L06	0E00510A	Screw M3x8 Philips Pan Head	3
L07	0E00606A	Screw M3x6 Philips Pan Head	4
L08	0E00507A	Nut Hex. M3	6
L09	0E00172A	Washer 3mm Toothed Lock	1
L10	0E00857A	BT Screw M3x6 Philips Binding Head	2
L11	0E00929A	Screw M4x8 Philips Binding Head	4
L12	0E00928A	Nut Hex. M4 Flange	4
L13	–	MIC Jack Nut	(3)
L14	–	MIC Jack Washer	(3)
L15	0H03825B	Screw M3x5 Sylinder Head	1
L16	0H03760B	Washer A	1
L17	0J04067A	Washer FT40	1
L18	0E00157A	Washer 3mm (Black Plastics)	1
C01	**JA03737A**	**Headphone Jack Ass'y**	**1**
		Serial No.: A11701001–	
01	0J04110A	Headphone Jack Holder	1
02	0B08511A	Headphone Jack	1
03	0B08765A	3P-H Connector	1
L01	–	Headphone Jack Nut	(1)
L02	–	Headphone Jack Washer	(1)
C02	**HA04018A**	**Display House Ass'y**	**1**
		Serial No.: A11701001–	
01	0H03866B	Display House	1
02	BA04233A	Display P.C.B. Ass'y	1
L01	0E00857A	BT Screw M3x6 Philips Binding Head	5
C03	**HA04016A**	**Front Escutcheon B Ass'y**	**1**
		Serial No.: A11701001–	
01	0H03872B	Front Escutcheon B	1
02	0J04117A	Light Intercepting Reflector	1
03	0H03840A	Filter Blue A	3
04	0H03849B	Indicator B	3
05	0H03841A	Filter Blue B	5
06	0H03848B	Indicator A	5
07	0H03862A	Function Button B	3
08	0H03861A	Function Button A	5
09	0J04115B	Function Switch Spring	8

8.11. Front Escutcheon A Ass'y (C04)

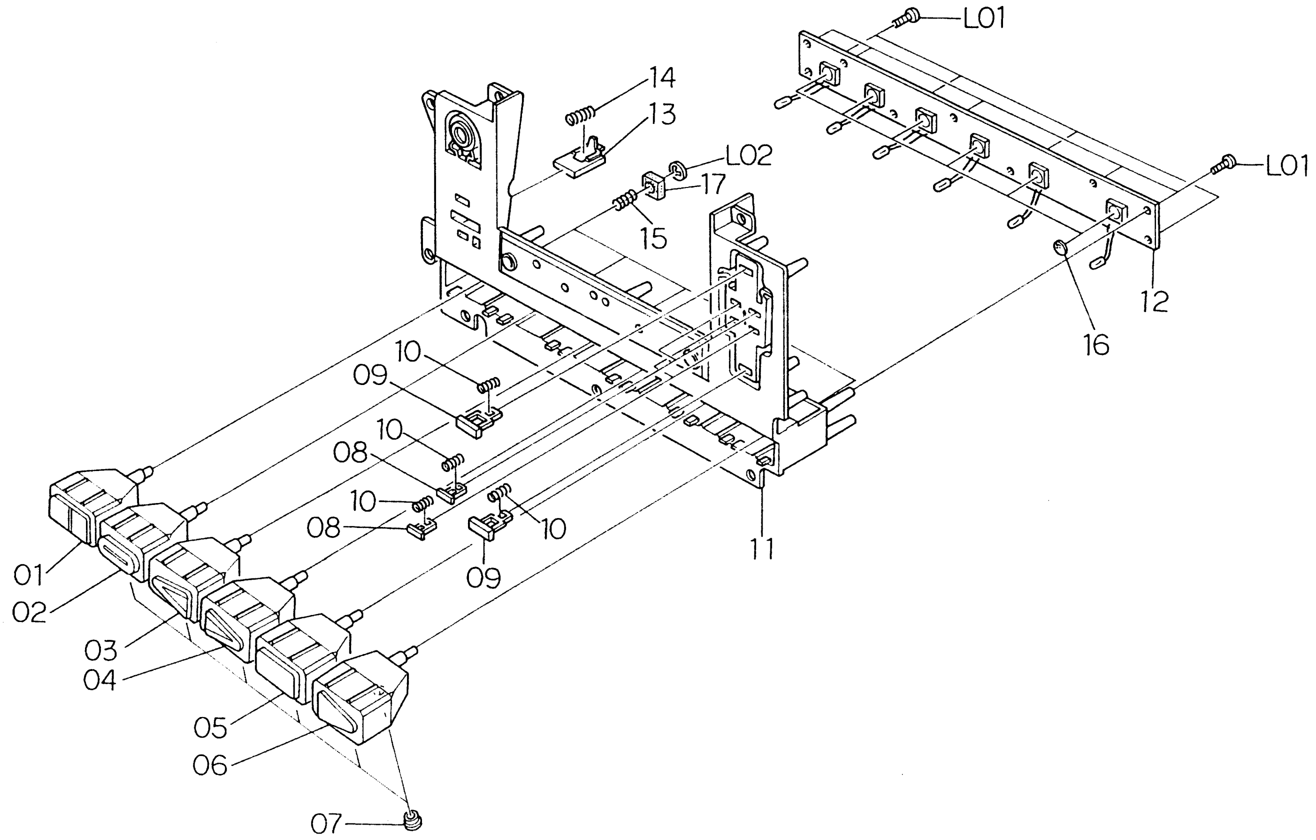


Fig. 8.11

Schematic Ref. No.	Part No.	Description	Q'ty
C04	**HA04015A**	**Front Escutcheon A Ass'y** Serial No.: A11701001–	**1**
01	HA04002A	Pause Button Ass'y	1
02	HA04003A	Record Button Ass'y	1
03	HA04004A	Rewind Button Ass'y	1
04	HA04005A	F.F. Button Ass'y	1
05	HA04006A	Stop Button Ass'y	1
06	HA04007A	Play Button Ass'y	1
07	0J04109A	Lamp Holder	6
08	0H03861A	Function Button A	4
09	0H03862A	Function Button B	2
10	0J04115B	Function Switch Spring	6
11	HA03998B	Front Escutcheon A Sub Ass'y	1
12	BA04239A	Mechanism Control Switch P.C.B. Ass'y	1
13	0H03865A	Eject Button	1
14	0J04114A	Power Switch Spring	1
15	0J04113B	Control Switch Spring	6
16	0J04290B	Switch Cushion	6
17	0J04296A	Button Cushion	6
L01	0E00857A	Screw M3x6 Philips Binding Head	9
L02	0E00926A	Stopper Ring CS 4mm	6

8.12. Mechanism Ass'y 1000ZXL (D01)

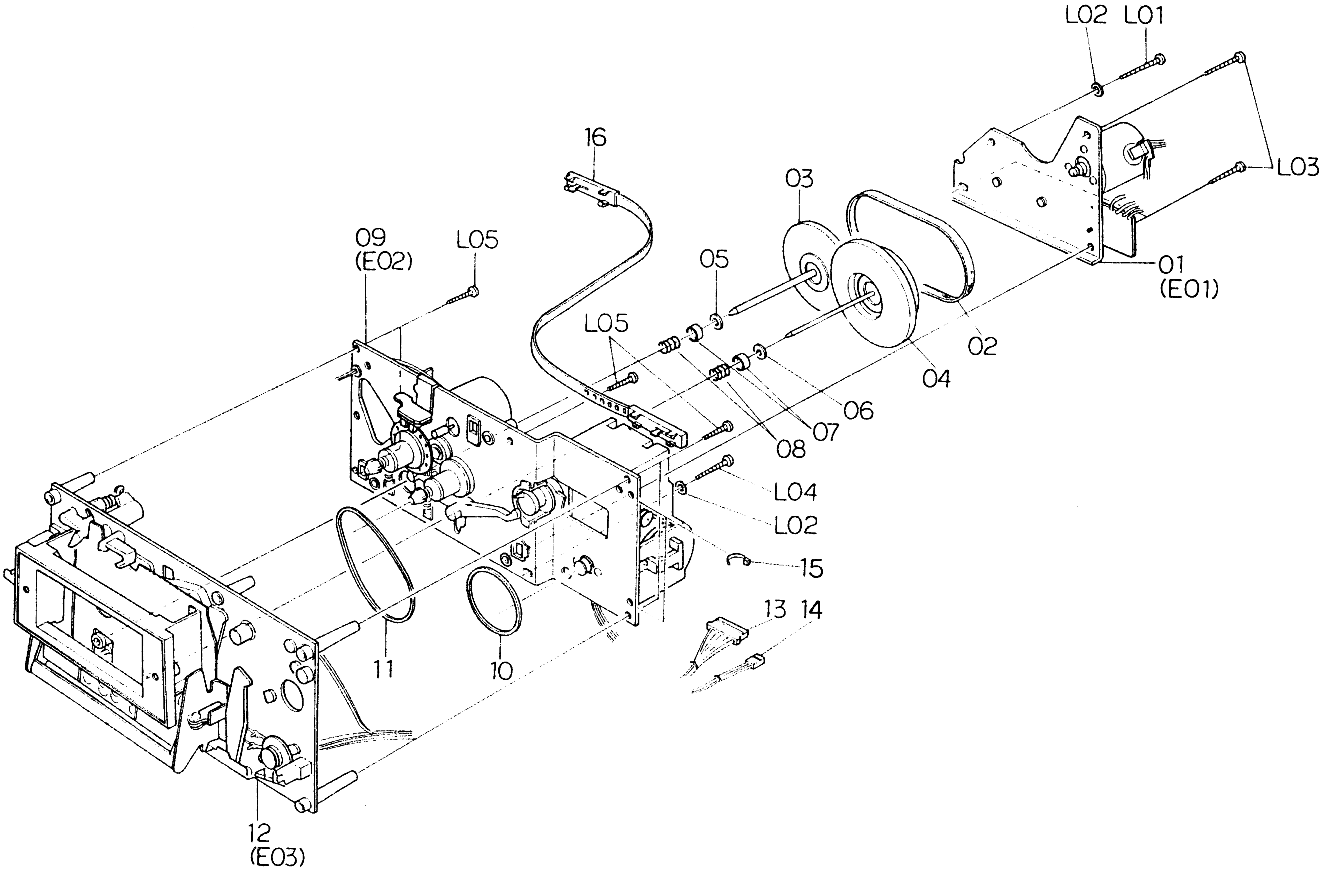


Fig. 8.12

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
D01	**CA08243B**	**Mechanism Ass'y 1000ZXL**	1	L03	0E00833A	BT Screw M3x20 Philips Pan Head	3
		Serial No.: A11701001–		L04	0E00835A	BT Screw M3x25 Philips Pan Head	1
01	CA08247A	Flywheel Holder Ass'y	1	L05	0E00883A	BT Screw M3x18 Philips Pan Head	5
02	0C08096C	Capstan Belt	1				
03	CA08173A	Supply Flywheel Ass'y	1				
04	CA08015A	Take-up Flywheel Ass'y	1				
05	0C08021B	Thrust Washer 3.1	1				
06	0C08020B	Thrust Washer 2.6	1				
07	0C08244A	Flange Thrust Cap	2				
08	0C08243A	Flange Thrust Spring	2				
09	CA08245A	Sub Mechanism Chassis Ass'y	1				
10	0C08099B	Control Motor Belt	1				
11	0C08098B	Counter Belt B	1				
12	CA08241A	Main Mechanism Chassis Ass'y	1				
13	0B08844A	10P-H Connector	1				
14	0B08652C	3P-H Connector	1				
15	0B08515A	Insh-Lock	16				
16	0C08237A	Azimuth Alignment Wire	1				
–	0M04169A	Mechanism Serial No. Seal	1				
L01	0E00834A	BT Screw M3x30 Philips Pan Head	1				
L02	0E00178A	Washer 3mm	2				

8.13. Chassis Sub Ass'y (D02)

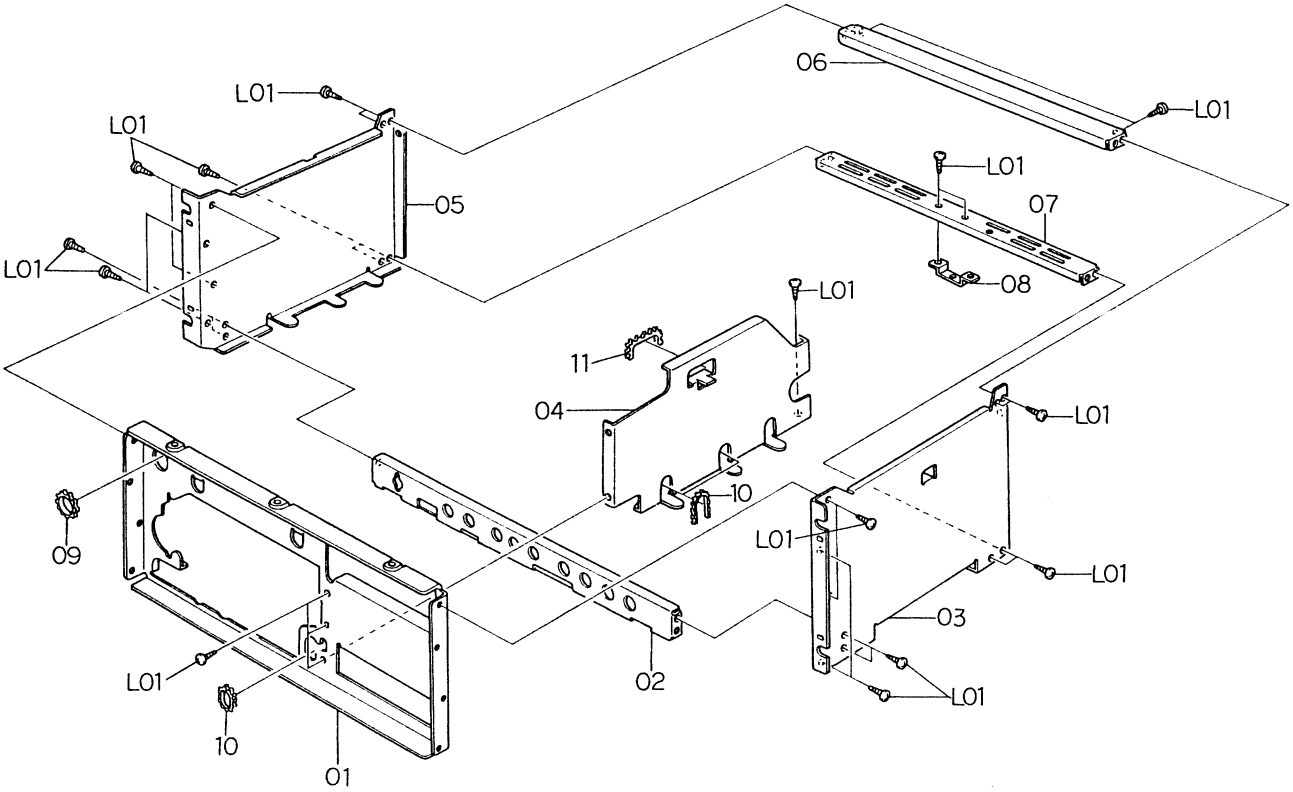

06
L01
L01
L01
05
L01
L01
07
08
L01
11
04
L01
09
10
L01
L01
03
02
L01
L01
10
01

Fig. 8.13

Schematic Ref. No.	Part No.	Description	Q'ty
D02	**JA03734A**	**Chassis Sub Ass'y** Serial No.: A11701001–	**1**
01	0J04138B	Front Chassis	1
02	0J04143A	Switch Plate Holder	1
03	0J04140C	Side Chassis R	1
04	0J04144C	Center Chassis	1
05	0J04139C	Side Chassis L	1
06	0J04142B	Top Plate	1
07	0J04141A	Bottom Plate	1
08	0J04150A	Cabinet Holder	1
09	0B08774A	Free Bushing 74mm	1
10	0B08775A	Free Bushing 67mm	3
11	0B08773A	Free Bushing 91mm	1
L01	0E00857A	BT Screw M3x6 Philips Binding Head	28
E01	**CA08247A**	**Flywheel Holder Ass'y** Serial No.: A11701001–	**1**
01	0C08013I	Flywheel Holder	1
02	0C08271A	Capstan Motor	1
03	0C08079G	Capstan Motor Pulley	1
04	BA04238A	Speed Cal. P.C.B. Ass'y	1
L01	0E00226A	Screw M2.6x4 Philips Pan Head	3
L02	0C08068C	Thrust Screw	2
L03	0C03857A	Lock Nut	2
L04	0E00843A	Screw M3x5 Philips Pan Head	1

8.14. Flywheel Holder Ass'y (E01)

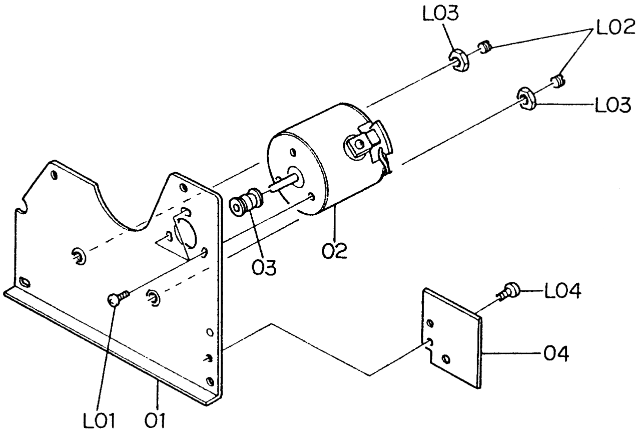

L03
L02
L03
02
03
L04
04
L01
01

Fig. 8.14

8.15. Sub Mechanism Chassis Ass'y (E02)

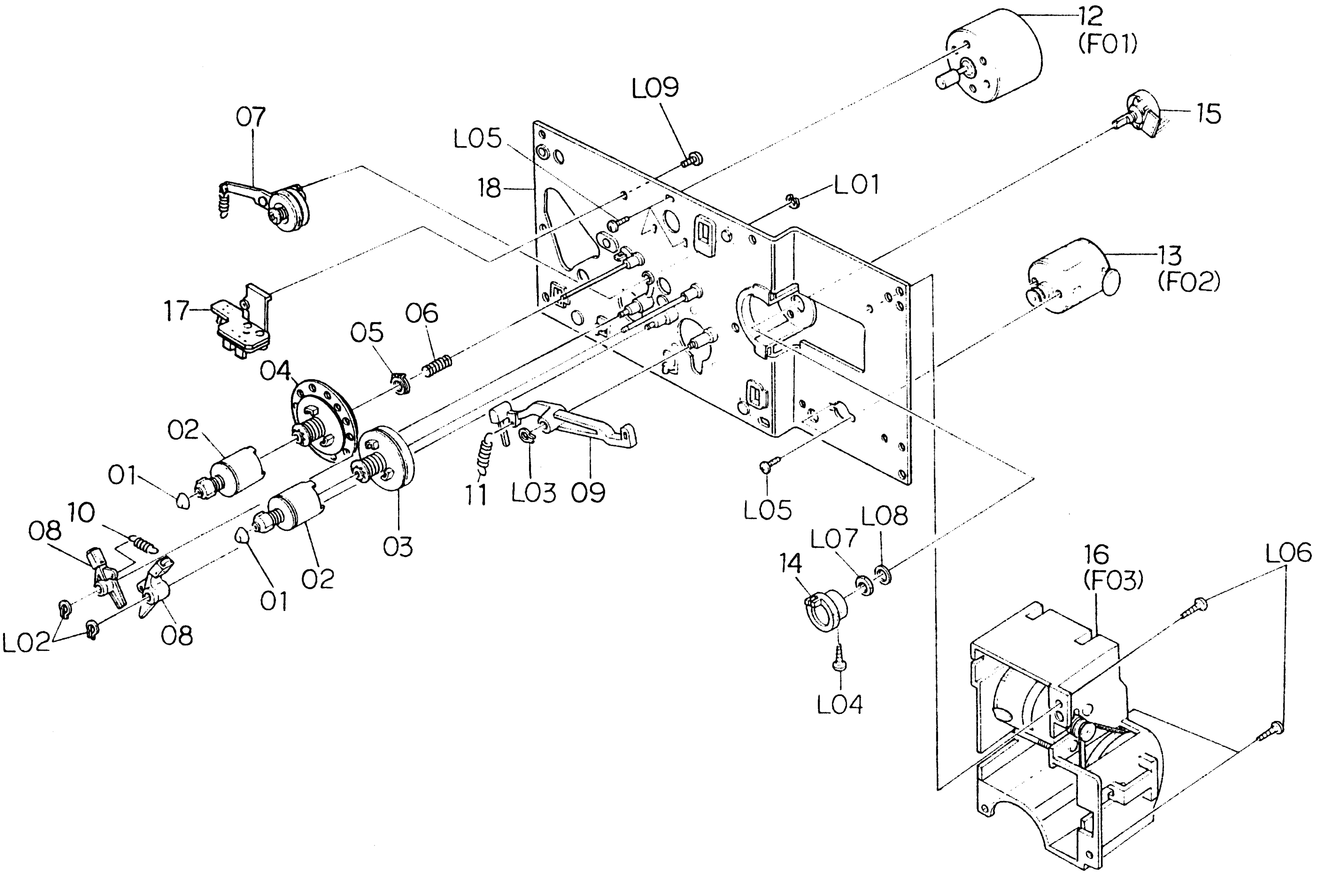


Fig. 8.15

Schematic Ref. No.	Part No.	Description	Q'ty
E02	CA08245A	Sub Mechanism Chassis Ass'y Serial No.: A11701001–	1
01	0C08039B	Reel Hub Head	2
02	CA08038C	Reel Hub B Ass'y	2
03	CA08037A	Reel Hub Take-up Ass'y	1
04	CA08236A	Reel Hub Supply Ass'y	1
05	CA08039A	Back Tension Ass'y	1
06	0C08269A	Back Tension Spring	1
07	CA08193A	Idler Ass'y	1
08	CA08042A	Brake Ass'y	2
09	0C08030C	Brake Drive Arm	1
10	0C08129A	Brake Arm Spring	1
11	0C08128A	Brake Drive Arm Spring	1
12	CA08242A	Reel Motor Ass'y	1
13	CA08034A	Control Motor Ass'y	1
14	0C08053B	Volume Coupler	1
15	0B07240A	Volume Control 10kΩ (B)	1
16	CA08148A	Azimuth Alignment Motor Ass'y	1
17	BA04237B	Counter Pulse Generator P.C.B. Ass'y	1
18	CA08194A	Sub Chassis Ass'y	1
L01	0E00698A	E-Ring 2.5mm	1
L02	0E00837A	Stopper Ring 3mm	2
L03	0E00838A	Stopper Ring 4mm	1
L04	0E00859A	BT Screw M2.6x6 Philips Binding Head	1
L05	0E00226A	Screw M2.6x4 Philips Pan Head	5
L06	0E00846A	BT Screw M3x8 Philips Pan Head	3
L07	–	Volume Nut	(1)
L08	–	Volume Washer	(1)
L09	0E00792A	BT Screw M2.6x6 Philips Pan Head	1

Schematic Ref. No.	Part No.	Description	Q'ty
E03	**CA08241A**	**Main Mechanism Chassis Ass'y** Serial No.: A11701001–	**1**
01	CA08239A	Cassette Case Holder L Ass'y	1
02	0C08151A	Lid Arm Spring Tube	1
03	CA08022A	Cassette Case Holder R Ass'y	1
04	CA08240A	Cassette Case Ass'y	1
05	CA08259A	Cover Plate Ass'y	1
06	CA08248A	Head Mount Base Ass'y	1
07	0C08121A	Supply Pressure Roller Spring	1
08	0C08250A	Supply Pressure Roller Spring B	1
09	CA08053B	Supply Pressure Roller Ass'y	1
10	0C08122B	Supply Pressure Roller Thrust Spring	1
11	CA08079B	Take-up Pressure Roller Ass'y	1
12	0C08183B	Take-up Pressure Roller Thrust Spring	1
13	CA08250A	Head Base Ass'y E	1
14	0C08182A	Pressure Roller Drive Bar B	1
15	0C08086B	Head Base Roller	3
16	0C08050B	Record Sensor	1
17	0C08051E	Cassette Hold Arm	1
18	0C08120A	Cassette Hold Spring	1
19	CA08196A	Back Tension Arm Ass'y	1
20	0C08254A	Tension Arm Collar	1
21	CA08027A	Head Base Drive Arm Ass'y	1
22	0C08143C	Head Base Drive Arm Spring	1
23	CA08026A	Pressure Roller Drive Arm Ass'y	1
24	CA08237A	Auto Shut-off Ass'y	1
25	0C08119A	Record Protector	1
26	0C08194C	Damper Lock Arm	1
27	0C08153A	Damper Lock Arm Spring Tube	1
28	0C08116A	Record Arm Spring	2
29	CA08030A	Pneumatic Damper Ass'y	1
30	CA08291A	Supply Capstan Flange Ass'y	1
31	CA08292A	Take-up Capstan Flange Ass'y	1
32	0C08186A	Cam Drive Gear	1
33	0C08029H	Control Cam	1
34	0C08117A	Counter-Load Arm Spring	1
35	0C08152A	Counter-Load Arm Spring Tube	1
36	CA08028A	Counter-Load Arm Ass'y	1
37	CA08183A	Main Chassis Ass'y	1
L01	0E00837A	Stopper Ring 3mm	9
L02	0E00832A	BT Screw M3x14 Philips Pan Head	2
L03	0E00834A	BT Screw M3x30 Philips Pan Head	2
L04	0E00831A	BT Screw M3x10 Philips Pan Head	3
L05	0E00254A	Washer 3.1mm (Plastics)	2
L06	0E00222A	E-Ring 2mm	2
L07	0E00876A	BT Screw M2.6x8 Philips Pan Head	8
L08	0C08060B	Height Adjustment Nut	2
L09	0E00142A	Washer 2.6mm	2
L10	0E00879A	BT Screw M2x15 Philips Pan Head	1
L11	0E00838A	Stopper Ring 4mm	3
L12	0E00846A	BT Screw M3x8 Philips Pan Head	3
L13	0E00895A	Earth Lug 3mm	2
L14	0E00859A	BT Screw M2.6x6 Philips Binding Head	1
L15	0E00255A	Washer 2.6mm	1

8.16. Main Mechanism Chassis Ass'y (E03)

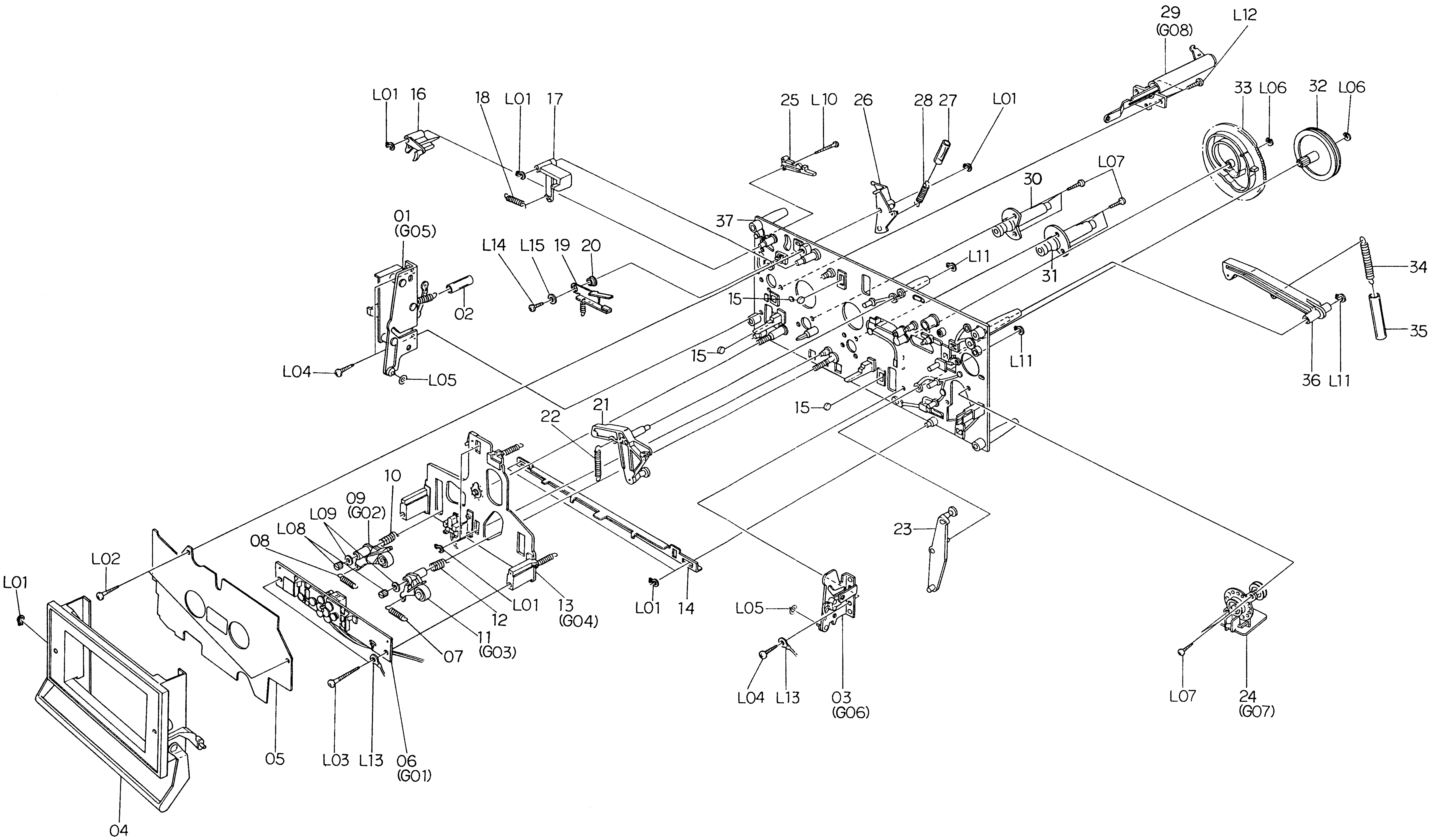

29
(G08)
L12
L01
16
18
L01
17
25
L10
26
28
27
L01
33
L06
32
L06
L07
30
37
01
(G05)
L14
L15
19
20
L11
31
34
02
15
35
15
L11
L04
L05
36
L11
22
21
15
10
09
(G02)
L09
L08
08
23
L02
L01
L01
13
(G04)
L01
14
L05
12
11
(G03)
07
L04
L13
03
(G06)
L07
24
(G07)
05
L03
L13
06
(G01)
04

Fig. 8.16

8.17. Reel Motor Ass'y (F01)

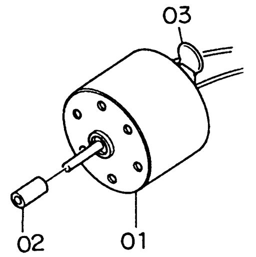


Fig. 8.17

8.18. Control Motor Ass'y (F02)

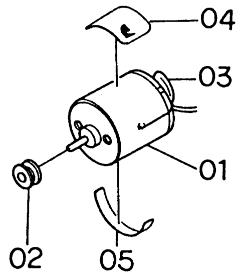

04
03
01
02
05

Fig. 8.18

8.19. Azimuth Alignment Motor Ass'y (F03)

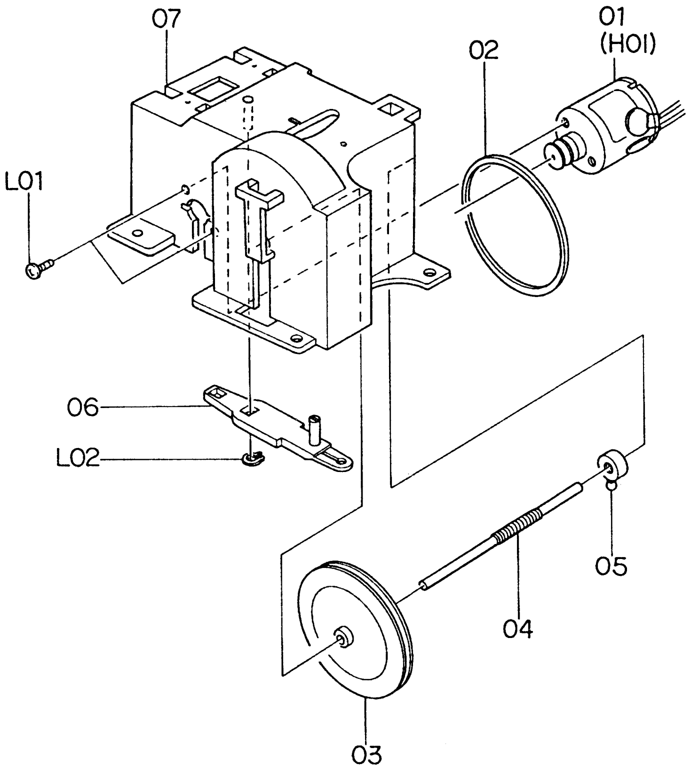

07
02
01
(H01)
L01
06
L02
05
04
03

Fig. 8.19

8.20 Head Mount Base Ass'y (G01)

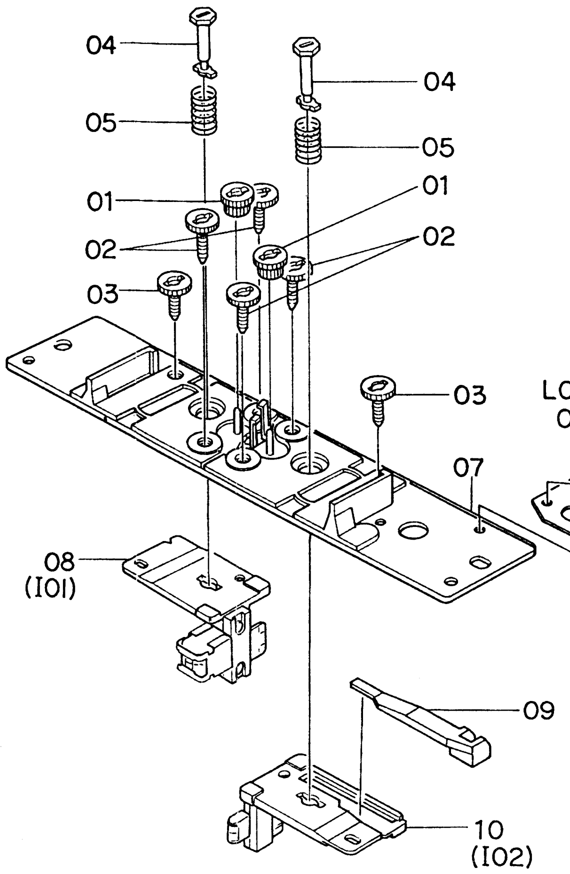

04
04
05
05
01
01
02
02
03
03
L01
06
07
08
(I01)
09
10
(I02)

Fig. 8.20

8.21. Supply Pressure Roller Ass'y (G02)

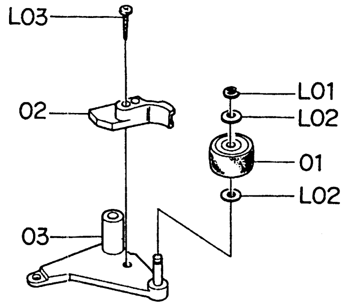

L03
02
L01
L02
01
L02
03

Fig. 8.21

8.22. Take-up Pressure Roller Ass'y (G03)

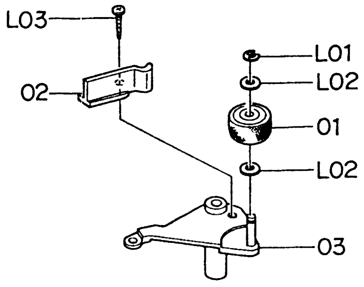

L03
L01
02
L02
01
L02
03

Fig. 8.22

8.23. Head Base Ass'y E (G04)

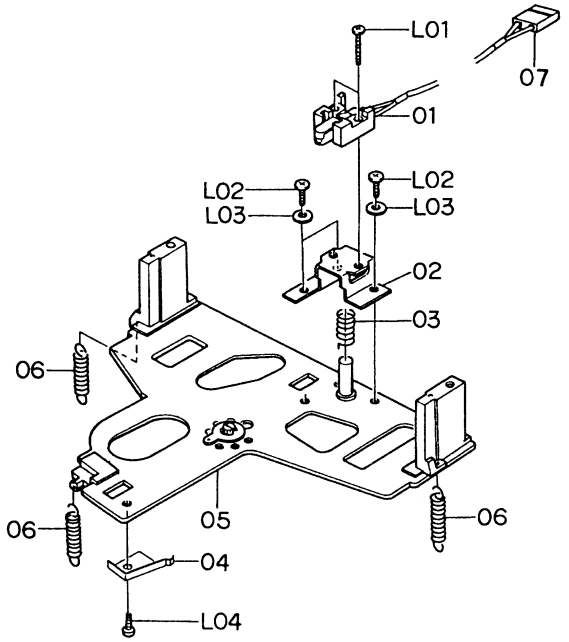

L01
07
01
L02
L02
L03
L03
02
03
06
05
06
06
04
L04

Fig. 8.23

8.24. Cassette Case Holder L Ass'y (G05)

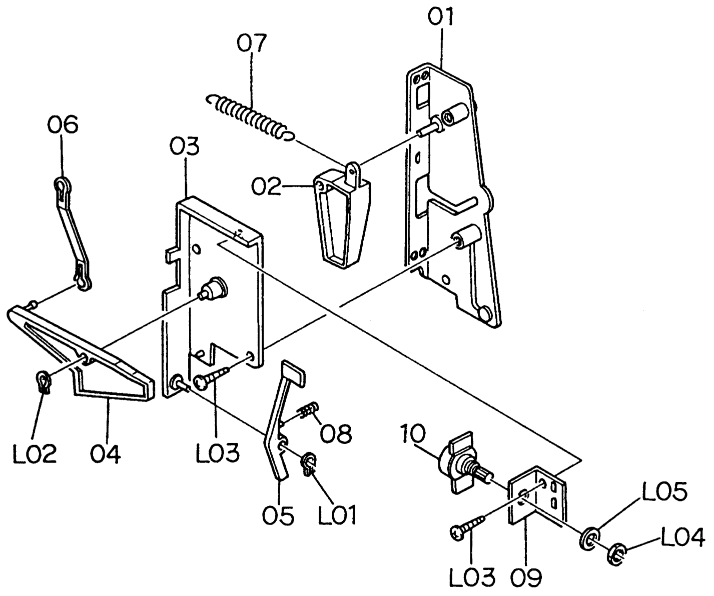

01
07
06
03
02
L02
04
L03
08
10
L05
05
L01
L04
L03
09

Fig. 8.24

8.25. Cassette Case Holder R Ass'y (G06)

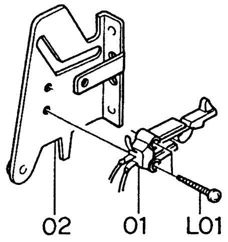


Fig. 8.25

Schematic Ref. No.	Part No.	Description	Q'ty
F01	**CA08242A**	**Reel Motor Ass'y** Serial No.: A11701001–	**1**
01	0C08272A	Reel Motor	1
02	0C08063F	Reel Motor Pulley	1
03	0B09290A	Ceramic Capacitor 0.01μ 50V Z	1
F02	**CA08034A**	**Control Motor Ass'y** Serial No.: A11701001–	**1**
01	0C08137A	Control Motor	1
02	0C08064A	Control Motor Pulley	1
03	0B09292A	Ceramic Capacitor 0.1μ 50V Z	1
04	0M03985A	Motor Label 730	1
05	0M03988A	Motor Seal B	1
F03	**CA08148A**	**Azimuth Alignment Motor Ass'y** Serial No.: A11701001–	**1**
01	CA08149A	Azimuth Motor Ass'y	1
02	0C08099B	Control Motor Belt	1
03	0C08229B	Drive Pulley	1
04	0C08230B	Drive Pulley Shaft	1
05	0C08231C	Drive Nut	1
06	0C08232C	Drive Bar	1
07	0C08233G	Drive Unit Base	1
L01	0E00226A	Screw M2.6x4 Philips Pan Head	2
L02	0E00837A	Stopper Ring 3mm	1
G01	**CA08248A**	**Head Mount Base Ass'y** Serial No.: A11701001–	**1**
01	0C08028C	Head Height Adjustment Gear	2
02	0C08027E	Head Height Adjustment Screw	4
03	0C08026D	Azimuth Alignment Screw	2
04	0C08161B	Spring Stopper	2
05	0C08187B	Head Plate Spring	2
06	0C08236A	Azimuth Alignment Wire Hold Plate	1
07	CA08083C	Head Mount Base Sub Ass'y	1
08	CA08244A	P-8L Playback Head Ass'y	1
09	0C08235A	Azimuth Alignment Plate	1
10	CA08238A	R-8L Record Head Ass'y	1
L01	0E00917A	BT Screw M2.6x5 Philips Pan Head	2
G02	**CA08053B**	**Supply Pressure Roller Ass'y** Serial No.: A11701001–	**1**
01	0C08164G	Pressure Roller	1
02	0C08189B	Supply Tape Guide	1
03	CA08061A	Supply Pressure Roller Arm Ass'y	1
L01	0E00042A	E-Ring 1.5mm	1
L02	0C08024A	Washer 2mm	2
L03	0E00788A	BT Screw M2x8 Philips Pan Head	1
G03	**CA08079A**	**Take-up Pressure Roller Ass'y** Serial No.: A11701001–	**1**
01	0C08164G	Pressure Roller	1
02	0C08181C	Take-up Tape Guide	1
03	CA08073B	Take-up Pressure Roller Arm Ass'y	1
L01	0E00042A	E-Ring 1.5mm	1
L02	0C08024A	Washer 2mm	2
L03	0E00788A	BT Screw M2x8 Philips Pan Head	1
G04	**CA08250A**	**Head Base Ass'y E** Serial No.: A11701001–	**1**
01	GA02083A	E-8LH Erase Head	1
02	0C08158D	EH Hold Plate	1
03	0C08166A	EH Hold Plate Spring	1
04	0C08174C	Cassette Hold Spring	1
05	CA08003P	Head Base Ass'y	1
06	0C08175A	Head Base L Spring	3
07	0B08764A	2P-H Connector	1
L01	0E00889A	Screw M1.7x8 Philips Pan Head	2
L02	0E00909A	Screw M2x6 Philips Pan Head	3
L03	0E00117A	Washer 2mm	3
L04	0E00853A	BT Screw M2x3 Philips Pan Head	1
G05	**CA08239A**	**Cassette Case Holder L Ass'y** Serial No.: A11701001–	**1**
01	CA08090F	Cassette Case L Sub Ass'y	1
02	0C08073C	Lid Arm A	1
03	0C08195G	Arm Holder	1
04	0C08245A	Eject Arm A	1
05	0C08197C	Eject Arm B	1
06	0C08199B	Eject Arm Joint	1
07	0C08114A	Lid Arm Spring	1
08	0C08211C	Eject Arm Spring	1
09	0C08248B	Pitch Control Volume Holder	1
10	0B07282A	Volume Control 20kΩ (B)	1
L01	0E00837A	Stopper Ring 3mm	1
L02	0E00838A	Stopper Ring 4mm	1
L03	0E00865A	BT Screw M3x10 Philips Binding Head	2
L04	–	Volume Nut	(1)
L05	–	Volume Washer	(1)
G06	**CA08022A**	**Cassette Case Holder R Ass'y** Serial No.: A11701001–	**1**
01	0C08133A	Eject Sensor	1
02	CA08044A	Cassette Case Holder R Sub Ass'y	1
L01	0E00840A	BT Screw M2x8 Philips Pan Head	2

8.26. Auto Shut-off Ass'y (G07)

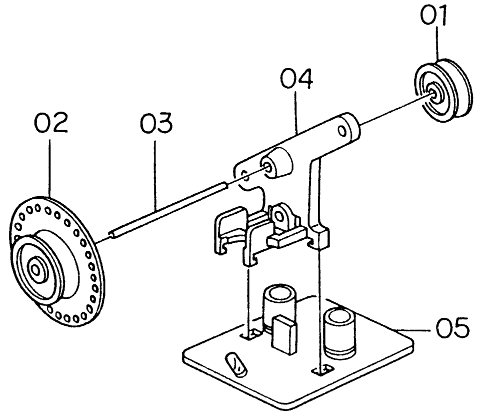

01
04
02
03
05

Fig. 8.26

8.27. Pneumatic Damper Ass'y (G08)

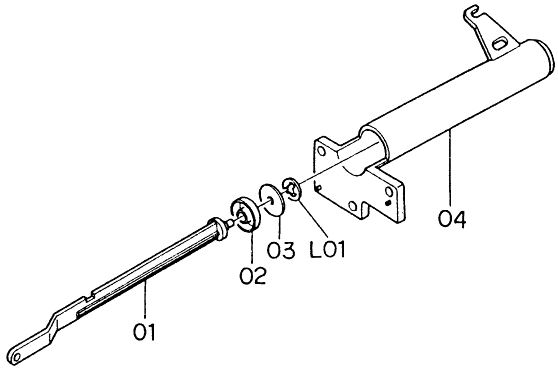

04
03
L01
02
01

Fig. 8.27

8.28. Azimuth Motor Ass'y (H01)

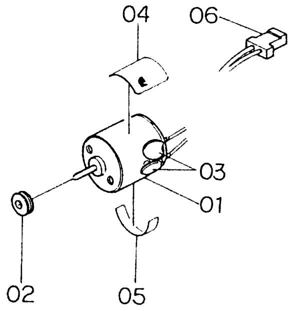

04
06
03
01
02
05

Fig. 8.28

8.29. P-8L Playback Head Ass'y (I01)

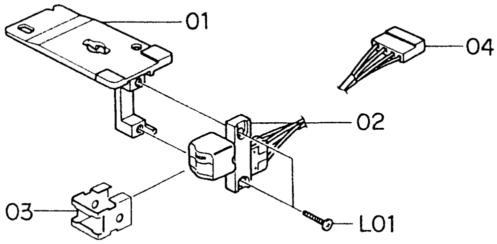

01
04
02
03
L01

Fig. 8.29

8.30. R-8L Record Head Ass'y (I02)

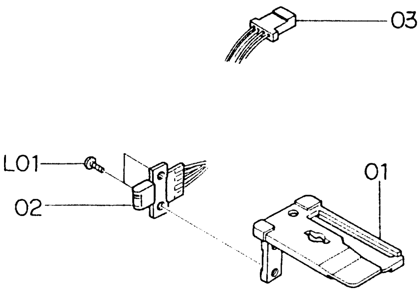


Fig. 8.30

Schematic Ref. No.	Part No.	Description	Q'ty
G07	**CA08237A**	**Auto Shut-off Ass'y** Serial No.: A11701001–	**1**
01	0C08047A	Shut-off Pulley A	1
02	0C08206B	Shut-off Pulley B	1
03	0C08088B	Shut-off Pulley Shaft	1
04	0C08207B	Shut-off Pulley Holder	1
05	BA04070A	Shut-off P.C.B. Ass'y	1
G08	**CA08030A**	**Pneumatic Damper Ass'y** Serial No.: A11701001–	**1**
01	0C08058C	Damper Piston	1
02	0C08102C	Damper Ring	1
03	0C08010C	Damper Plate	1
04	0C08059D	Sylinder	1
L01	0E00874A	Stopper Ring CS 2mm	1
H01	**CA08149A**	**Azimuth Motor Ass'y** Serial No.: A11701001–	**1**
01	0C08137A	Control Motor	1
02	0C08064A	Control Motor Pulley	1
03	0B09292A	Ceramic Capacitor 0.1μ 50V Z	2
04	0M03985A	Motor Label 730	1
05	0M03988A	Motor Seal B	1
06	0B08708A	2P Connector	1
I01	**CA08244A**	**P-8L Playback Head Ass'y** Serial No.: A11701001–	**1**
01	0C08160F	Head Plate	1
02	GA02101A	P-8LZ Playback Head	1
03	0C08169D	Pad Lifter 54	1
04	0B08767A	4P-H Connector	1
L01	0E00886A	Screw M1.7x6.5 Philips Pan Head	2
I02	**CA08238A**	**R-8L Record Head Ass'y** Serial No.: A11701001–	**1**
01	0C08234B	Head Plate	1
02	GA02102A	R-8LZ Record Head	1
03	0B08768A	4P-H Connector	1
L01	0E00887A	Screw M1.7x4 Philips Pan Head	2

9. TIMING CHART AND FLOW CHART

9.1. Overall Timing Chart

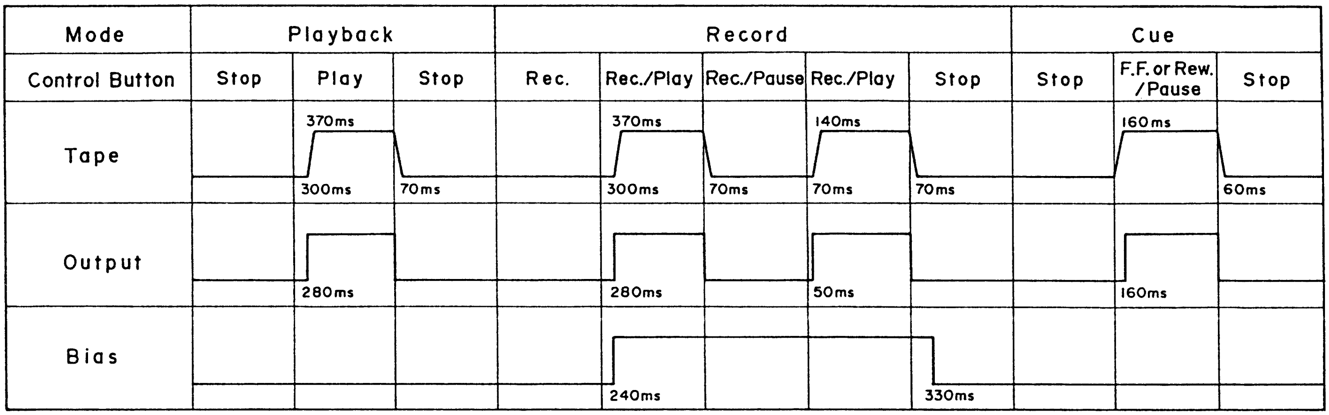

Mode
Playback
Record
Cue
Control Button
Stop
Play
Stop
Rec.
Rec./Play
Rec./Pause
Rec./Play
Stop
Stop
F.F. or Rew. /Pause
Stop
Tape
370ms
370ms
140ms
160ms
300ms
70ms
300ms
70ms
70ms
70ms
60ms
Output
280ms
280ms
50ms
160ms
Bias
240ms
330ms

Fig. 9.1

9.2. Auto Calibration and RAMM Control

(1) Auto Calibration Timing Chart

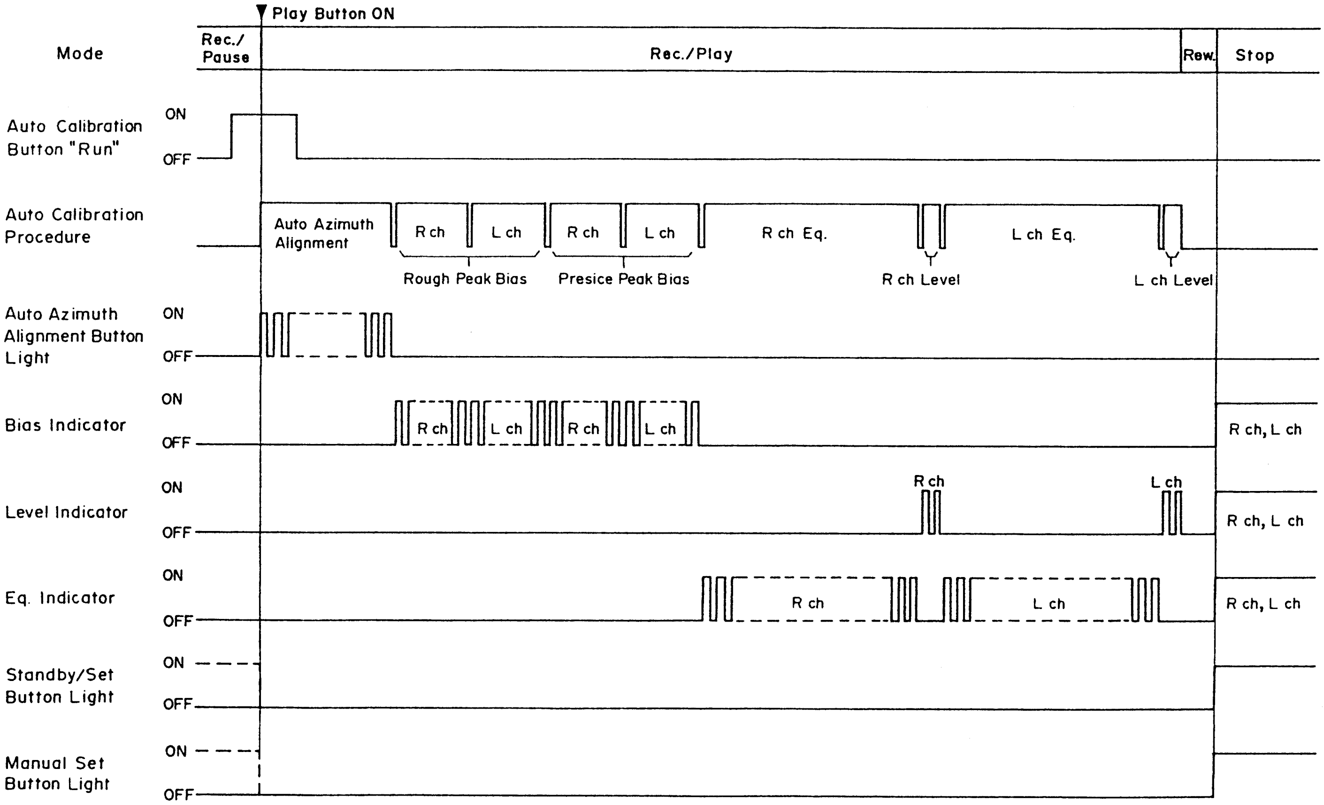
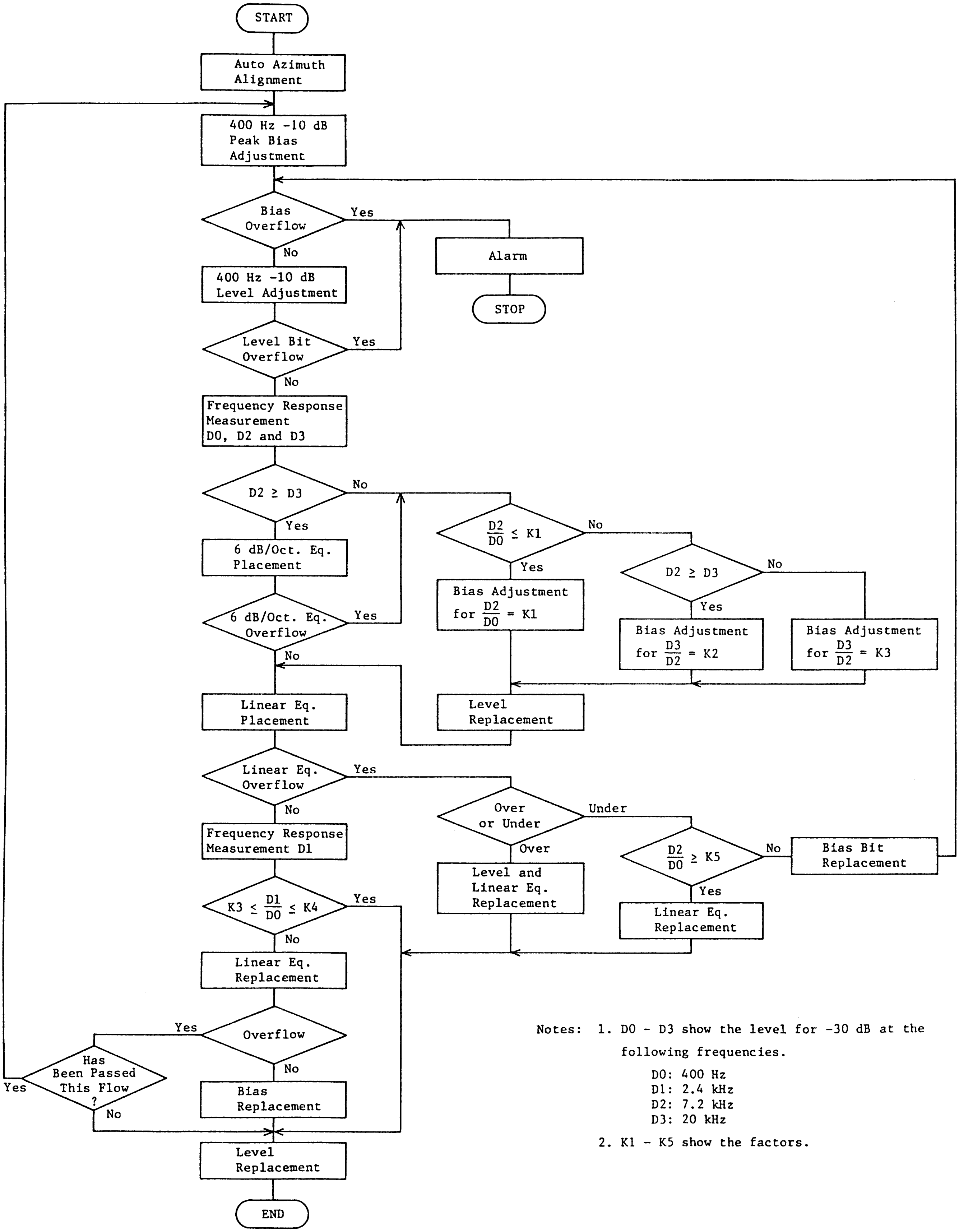

Play Button ON
Mode
Rec./ Pause
Rec./Play
Rew.
Stop
Auto Calibration Button "Run"
ON
OFF
Auto Calibration Procedure
Auto Azimuth Alignment
R ch
L ch
R ch
L ch
R ch Eq.
L ch Eq.
Rough Peak Bias
Presice Peak Bias
R ch Level
L ch Level
Auto Azimuth Alignment Button Light
ON
OFF
Bias Indicator
ON
OFF
R ch
L ch
R ch
L ch
R ch, L ch
Level Indicator
ON
OFF
R ch
L ch
R ch, L ch
Eq. Indicator
ON
OFF
R ch
L ch
R ch, L ch
Standby/Set Button Light
ON
OFF
Manual Set Button Light
ON
OFF

Fig. 9.2

(2) Auto Calibration Flow Chart


START
Auto Azimuth Alignment
400 Hz -10 dB Peak Bias Adjustment
Bias Overflow
Yes
No
Alarm
STOP
400 Hz -10 dB Level Adjustment
Level Bit Overflow
Yes
No
Frequency Response Measurement D0, D2 and D3
D2 ≥ D3
No
Yes
6 dB/Oct. Eq. Placement
6 dB/Oct. Eq. Overflow
Yes
No
D2/D0 ≤ K1
No
Yes
Bias Adjustment for D2/D0 = K1
D2 ≥ D3
No
Yes
Bias Adjustment for D3/D2 = K2
Bias Adjustment for D3/D2 = K3
Level Replacement
Linear Eq. Placement
Linear Eq. Overflow
Yes
No
Over or Under
Under
Over
Level and Linear Eq. Replacement
D2/D0 ≥ K5
No
Yes
Bias Bit Replacement
Linear Eq. Replacement
Frequency Response Measurement D1
K3 ≤ D1/D0 ≤ K4
Yes
No
Linear Eq. Replacement
Overflow
Yes
No
Has Been Passed This Flow ?
Yes
No
Bias Replacement
Level Replacement
END

Notes: 1. D0 - D3 show the level for -30 dB at the following frequencies.

D0: 400 Hz
D1: 2.4 kHz
D2: 7.2 kHz
D3: 20 kHz

2. K1 - K5 show the factors.

Fig. 9.3

(3) RAMM Coding Timing Chart

(a) Automatic Coding

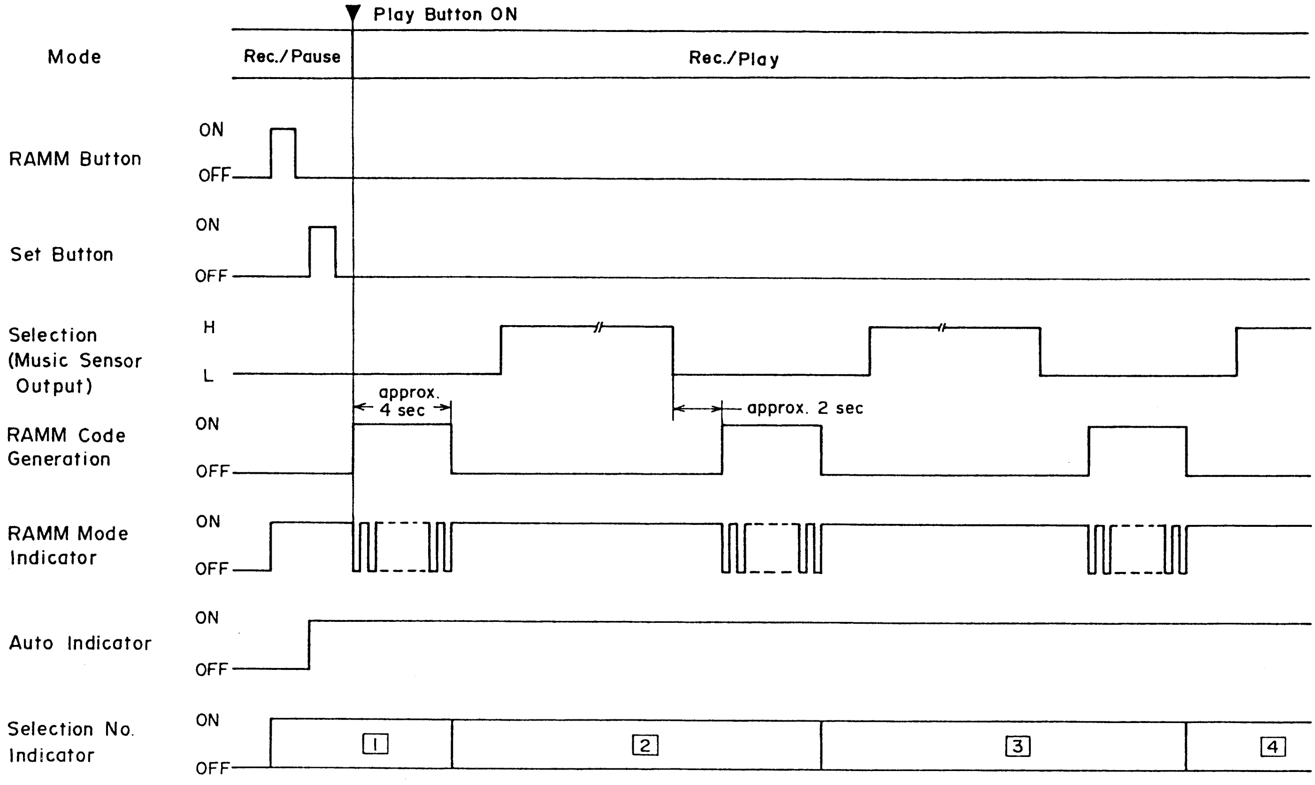

Play Button ON
Mode
Rec./Pause
Rec./Play
RAMM Button
ON
OFF
Set Button
ON
OFF
Selection (Music Sensor Output)
H
L
approx. 4 sec
approx. 2 sec
RAMM Code Generation
ON
OFF
RAMM Mode Indicator
ON
OFF
Auto Indicator
ON
OFF
Selection No. Indicator
ON
OFF
1
2
3
4

Fig. 9.4

(b) Manual Coding

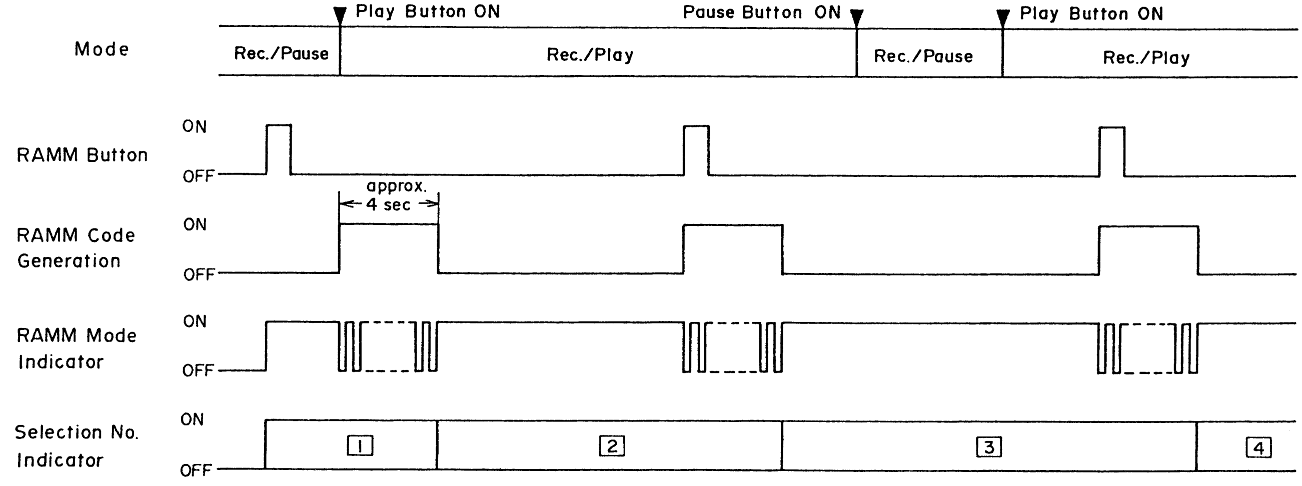

Play Button ON
Pause Button ON
Play Button ON
Mode
Rec./Pause
Rec./Play
Rec./Pause
Rec./Play
RAMM Button
ON
OFF
approx. 4 sec
RAMM Code Generation
ON
OFF
RAMM Mode Indicator
ON
OFF
Selection No. Indicator
ON
OFF
1
2
3
4

Fig. 9.5

(4) RAMM Code Tape Playback Flow Chart and Timing Chart

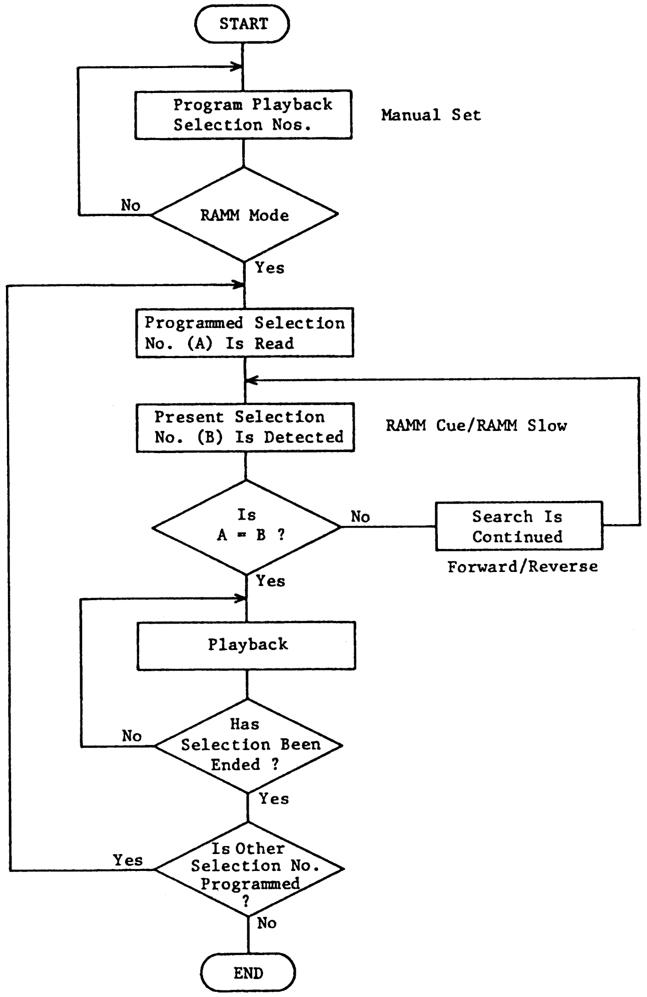

START
Program Playback Selection Nos.
Manual Set
No
RAMM Mode
Yes
Programmed Selection No. (A) Is Read
Present Selection No. (B) Is Detected
RAMM Cue/RAMM Slow
Is A = B ?
No
Search Is Continued
Forward/Reverse
Yes
Playback
No
Has Selection Been Ended ?
Yes
Yes
Is Other Selection No. Programmed ?
No
END

Fig. 9.6

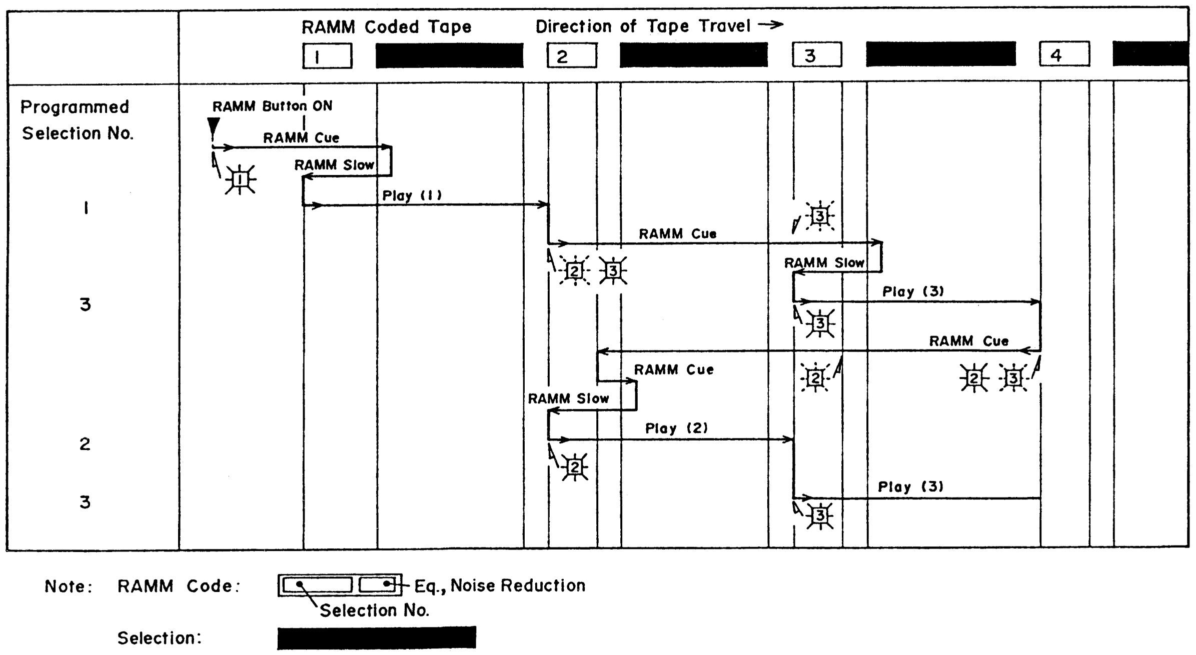

RAMM Coded Tape
Direction of Tape Travel →
1
2
3
4
Programmed Selection No.
1
3
2
3
RAMM Button ON
RAMM Cue
RAMM Slow
Play (1)
RAMM Cue
RAMM Slow
Play (3)
RAMM Cue
RAMM Cue
RAMM Slow
Play (2)
Play (3)
1
2
3
Note: RAMM Code:
Eq., Noise Reduction
Selection No.
Selection:

Fig. 9.7

10. EQ. AMP. FREQUENCY RESPONSE

10.1. Playback Frequency Response

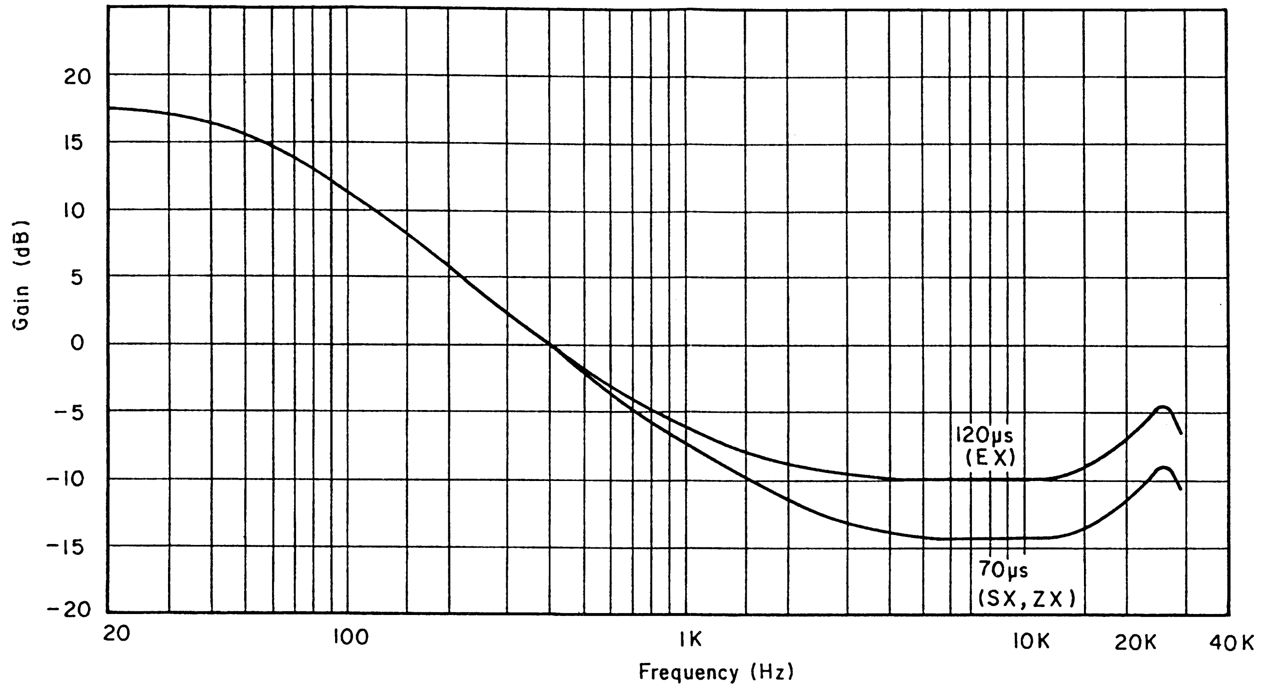


Fig. 10.1

10.2. Record Current Frequency Response

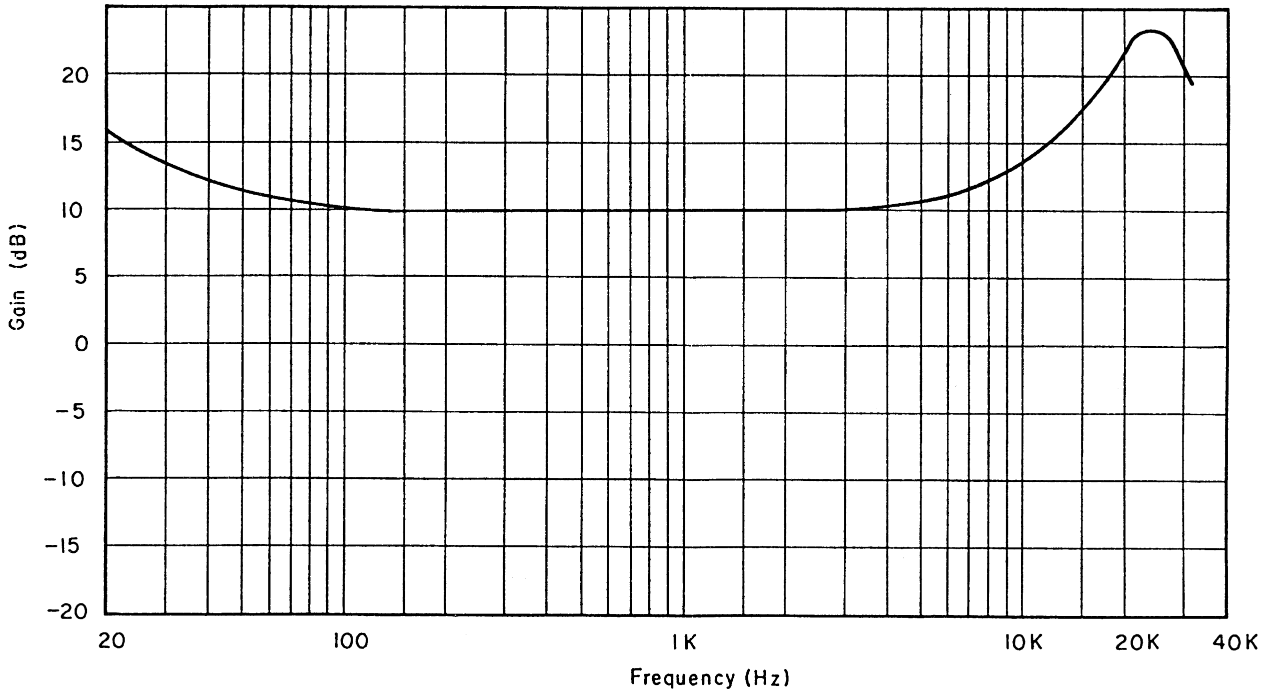


Fig. 10.2

Note: The curve shows the fixed record current frequency response before auto calibration is made in the N-1000ZXL without memory back-up batteries.

11. BLOCK DIAGRAMS

11.1. Amplifier and A.B.E.L. CPU Control

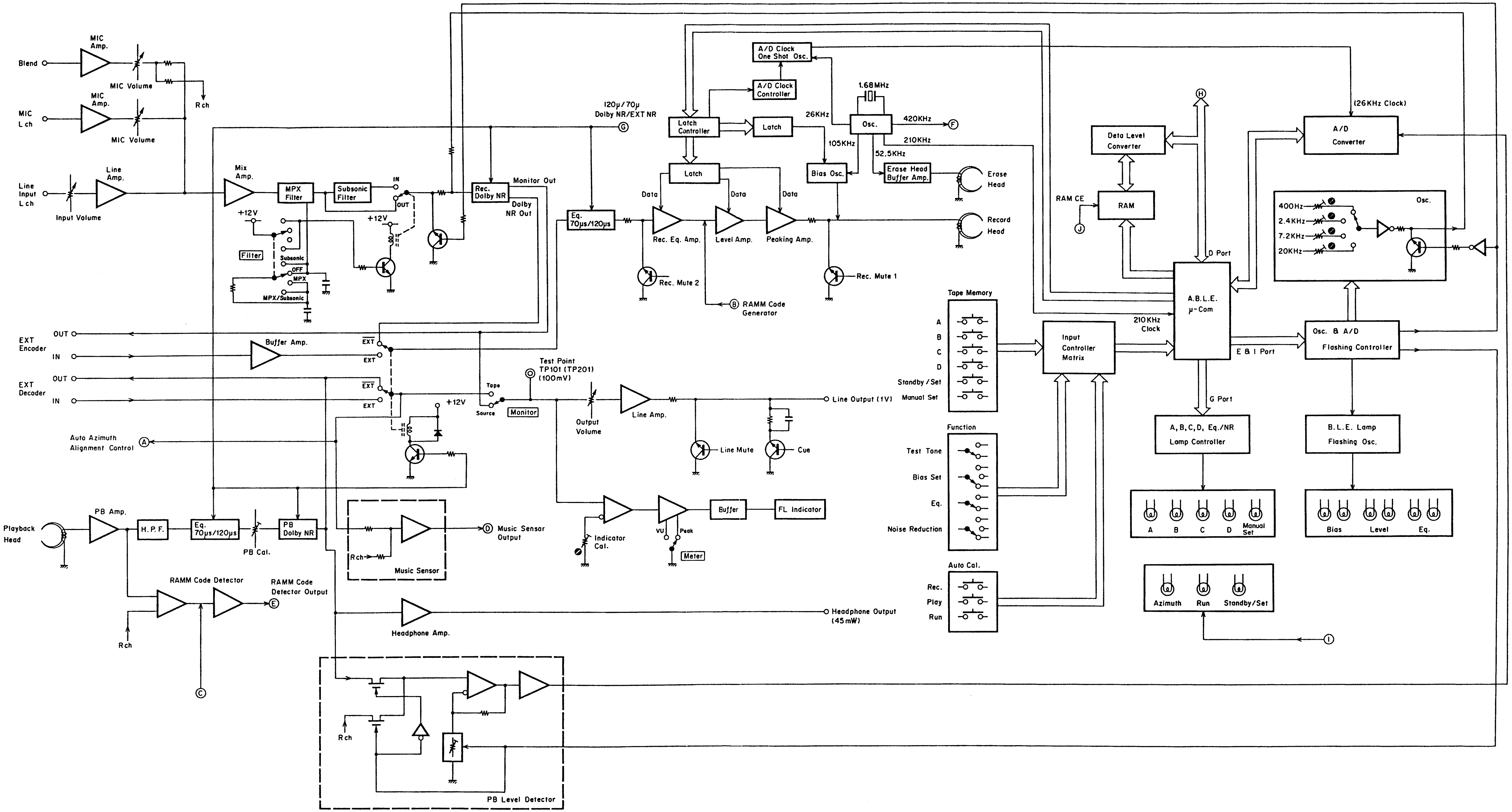

Blend
MIC Amp.
MIC Volume
MIC L ch
MIC Amp.
MIC Volume
R ch
Line Input L ch
Input Volume
Line Amp.
Mix Amp.
MPX Filter
Subsonic Filter
IN
OUT
+12V
+12V
Filter
Subsonic
OFF
MPX
MPX/Subsonic
Rec. Dolby NR
Monitor Out
Dolby NR Out
120μ/70μ Dolby NR/EXT NR
G
A/D Clock One Shot Osc.
A/D Clock Controller
1.68MHz
Latch Controller
Latch
26KHz
Osc.
420KHz
F
105KHz
210KHz
52.5KHz
Latch
Bias Osc.
Erase Head Buffer Amp.
Erase Head
Data
Data
Data
Eq. 70μs/120μs
Rec. Eq. Amp.
Level Amp.
Peaking Amp.
Record Head
Rec. Mute 2
Rec. Mute 1
B RAMM Code Generator
H
Data Level Converter
RAM CE
J
RAM
D Port
(26KHz Clock)
A/D Converter
Osc.
400Hz
2.4KHz
7.2KHz
20KHz
A.B.L.E. μ-Com
210KHz Clock
E & I Port
Osc. & A/D Flashing Controller
G Port
Input Controller Matrix
EXT Encoder OUT
IN
Buffer Amp.
EXT
EXT
EXT Decoder OUT
IN
EXT
EXT
+12V
Tape
Source
Monitor
Test Point TP101 (TP201) (100mV)
Output Volume
Line Amp.
Line Output (1V)
Line Mute
Cue
Auto Azimuth Alignment Control A
Tape Memory
A
B
C
D
Standby/Set
Manual Set
Function
Test Tone
Bias Set
Eq.
Noise Reduction
Auto Cal.
Rec.
Play
Run
A, B, C, D, Eq./NR Lamp Controller
A
B
C
D
Manual Set
B.L.E. Lamp Flashing Osc.
Bias
Level
Eq.
Azimuth
Run
Standby/Set
I
Playback Head
PB Amp.
H.P.F.
Eq. 70μs/120μs
PB Cal.
PB Dolby NR
Music Sensor
R ch
D Music Sensor Output
Indicator Cal.
VU
Peak
Meter
Buffer
FL Indicator
RAMM Code Detector
RAMM Code Detector Output
E
R ch
C
Headphone Amp.
Headphone Output (45mW)
R ch
PB Level Detector

Fig. 11.1

11.2. Mechanism Control and RAMM Control

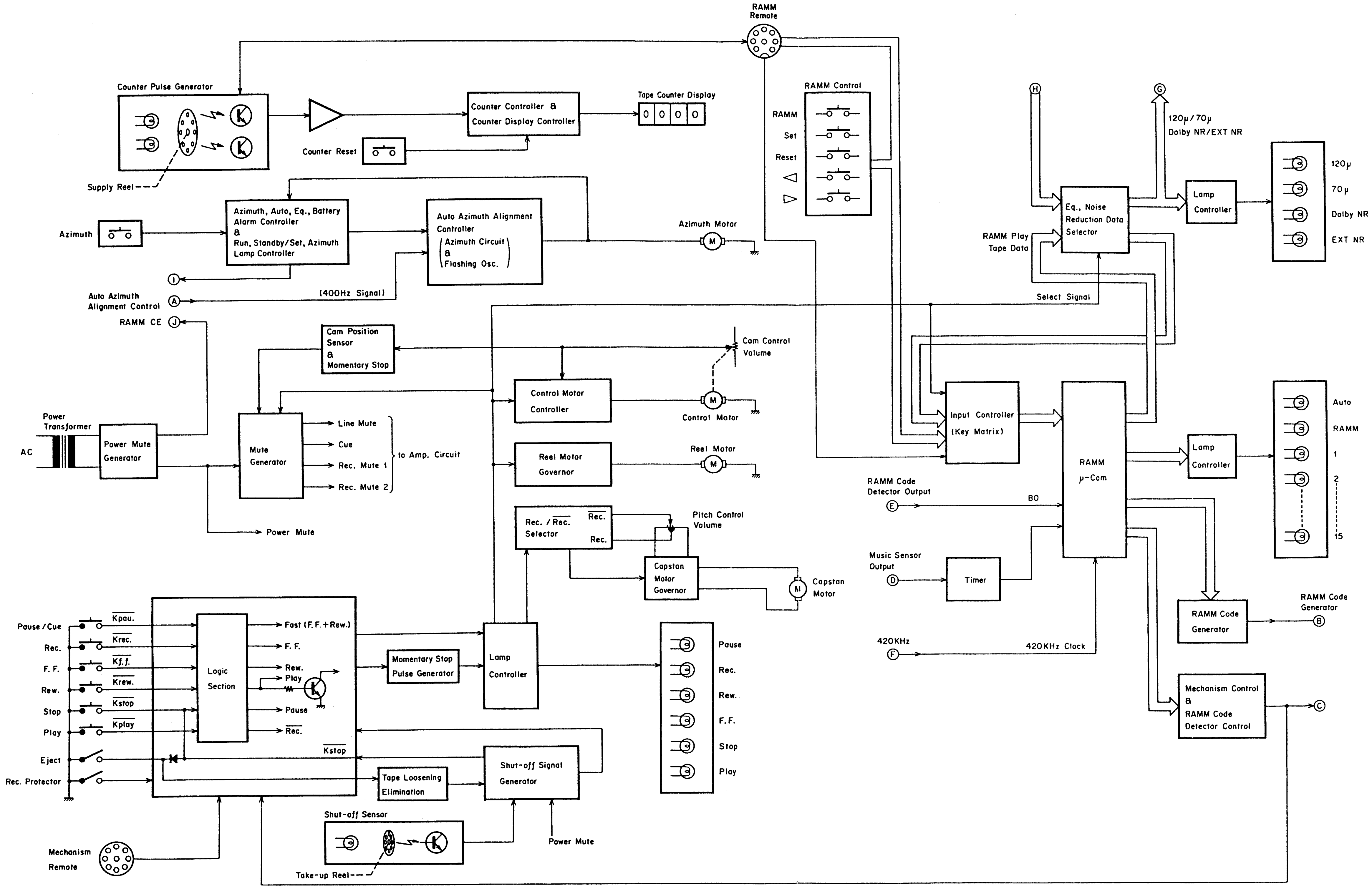

RAMM Remote
Counter Pulse Generator
Supply Reel
Counter Controller & Counter Display Controller
Tape Counter Display
0 0 0 0
Counter Reset
RAMM Control
RAMM
Set
Reset
◁
▷
Azimuth
Azimuth, Auto, Eq., Battery Alarm Controller & Run, Standby/Set, Azimuth Lamp Controller
Auto Azimuth Alignment Controller (Azimuth Circuit & Flashing Osc.)
Azimuth Motor
M
Ⓘ
Auto Azimuth Alignment Control Ⓐ
(400Hz Signal)
RAMM CE Ⓙ
Ⓗ
Ⓖ
120µ/70µ
Dolby NR/EXT NR
Eq., Noise Reduction Data Selector
RAMM Play Tape Data
Select Signal
Lamp Controller
120µ
70µ
Dolby NR
EXT NR
Cam Position Sensor & Momentary Stop
Cam Control Volume
Control Motor Controller
Control Motor
Power Transformer
AC
Power Mute Generator
Mute Generator
Line Mute
Cue
Rec. Mute 1
Rec. Mute 2
to Amp. Circuit
Power Mute
Reel Motor Governor
Reel Motor
Rec. / Rec. Selector
Rec.
Rec.
Pitch Control Volume
Capstan Motor Governor
Capstan Motor
Input Controller (Key Matrix)
RAMM µ-Com
Lamp Controller
Auto
RAMM
1
2
15
RAMM Code Detector Output Ⓔ
B0
Music Sensor Output Ⓓ
Timer
420KHz Ⓕ
420KHz Clock
RAMM Code Generator
RAMM Code Generator Ⓑ
Mechanism Control & RAMM Code Detector Control
Ⓒ
Pause/Cue
Rec.
F. F.
Rew.
Stop
Play
Eject
Rec. Protector
Kpau.
Krec.
Kf.f.
Krew.
Kstop
Kplay
Logic Section
Fast (F.F.+Rew.)
F. F.
Rew.
Play
Pause
Rec.
Kstop
Momentary Stop Pulse Generator
Lamp Controller
Pause
Rec.
Rew.
F.F.
Stop
Play
Tape Loosening Elimination
Shut-off Signal Generator
Power Mute
Shut-off Sensor
Take-up Reel
Mechanism Remote

Fig. 11.2

12. WIRING DIAGRAM

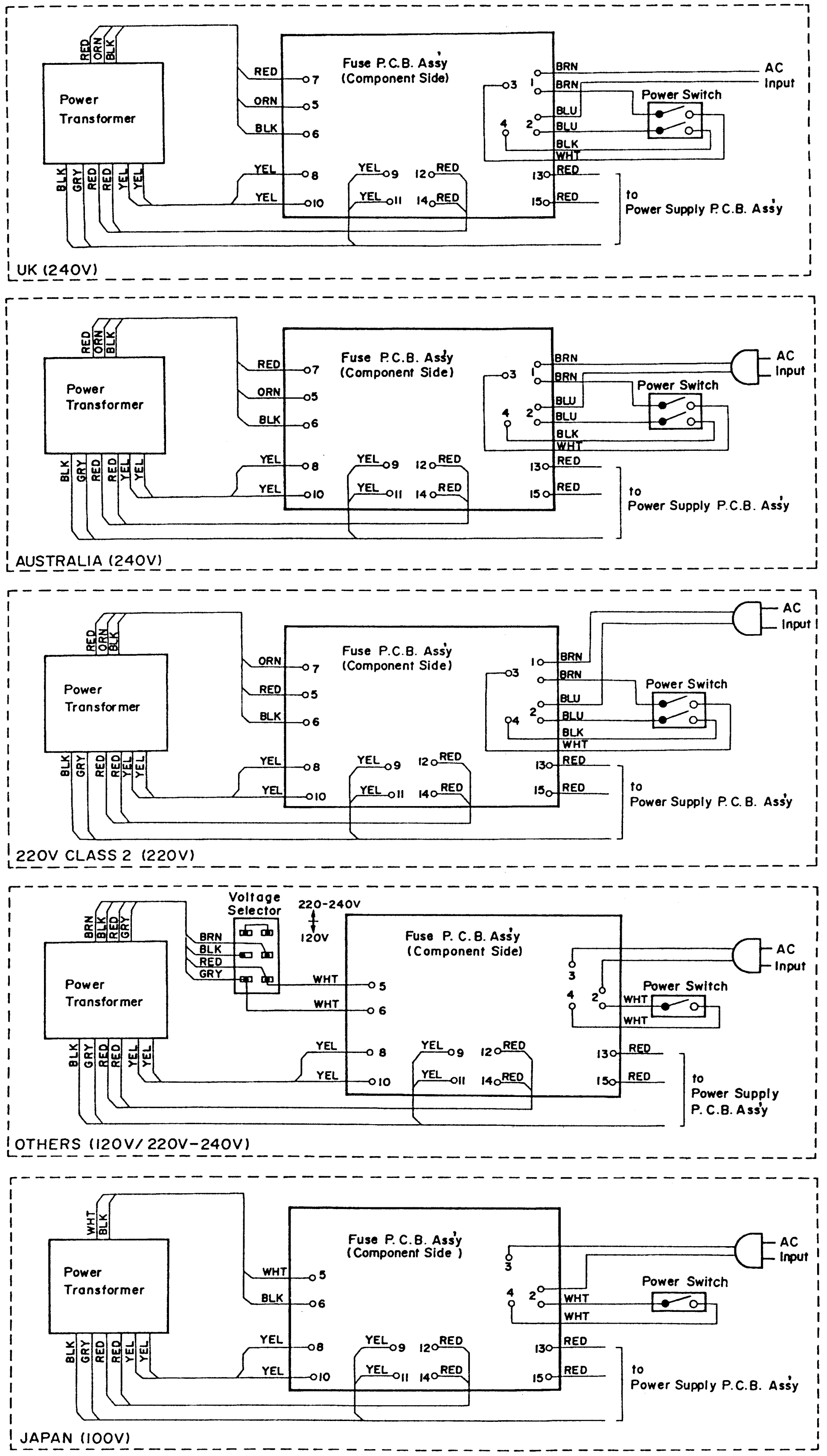

Power Transformer
Fuse P.C.B. Ass'y (Component Side)
Power Switch
AC Input
to Power Supply P.C.B. Ass'y
RED
ORN
BLK
GRY
YEL
BRN
BLU
WHT
UK (240V)
AUSTRALIA (240V)
220V CLASS 2 (220V)
Voltage Selector
220-240V
120V
OTHERS (120V/220V-240V)
JAPAN (100V)

Fig. 12.1

Note: Table of wire colors

BLK	Black
BLU	Blue
GRN	Green
RED	Red
WHT	White
ORN	Orange
GRY	Gray
BRN	Brown
YEL	Yellow
VIO	Violet

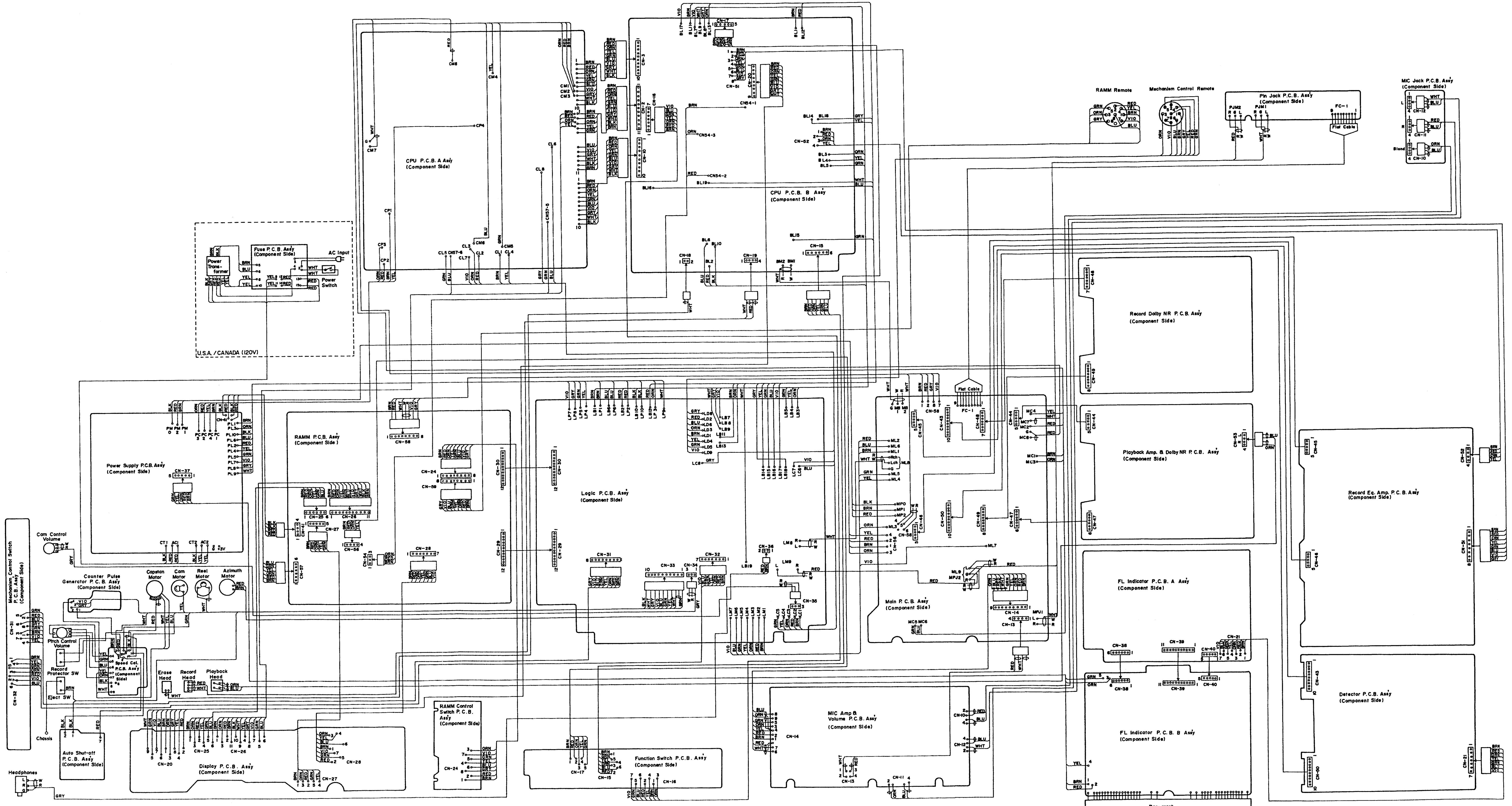
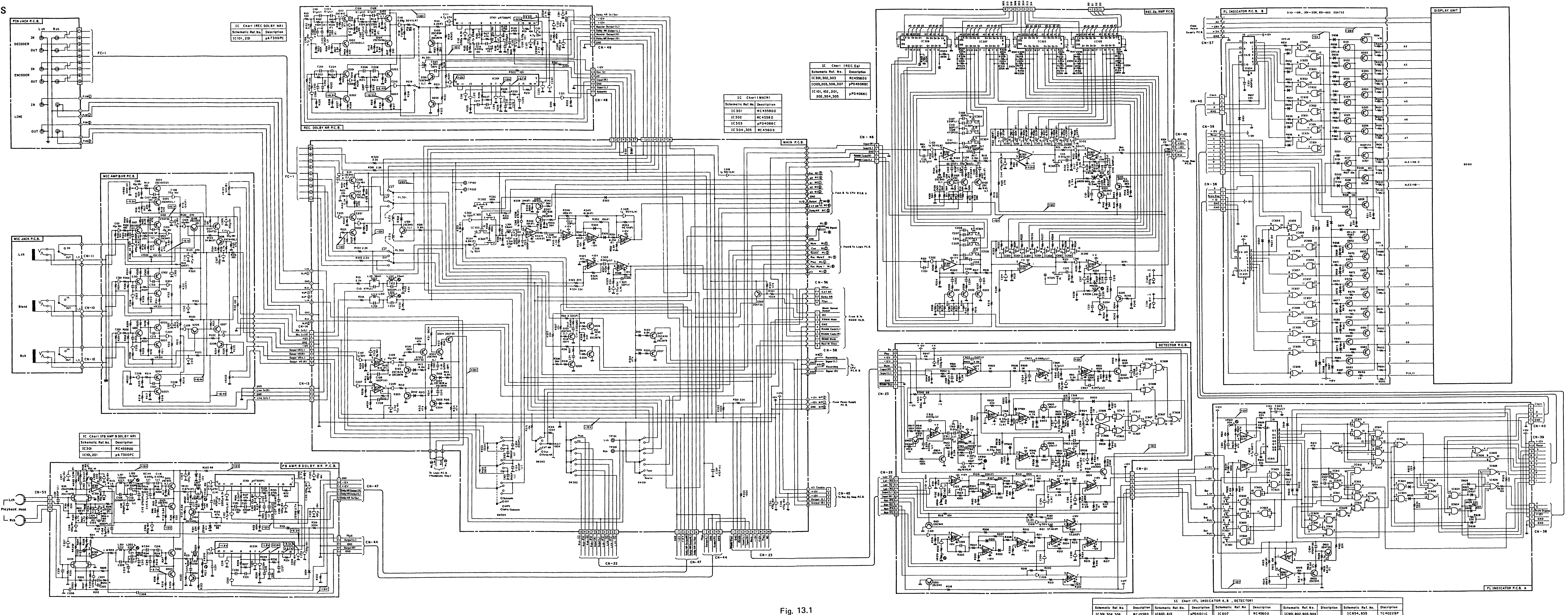

CPU P.C.B. A Ass'y (Component Side)
CPU P.C.B. B Ass'y (Component Side)
Power Transformer
Fuse P.C.B. Ass'y (Component Side)
AC Input
Power Switch
U.S.A./CANADA (120V)
RAMM Remote
Mechanism Control Remote
Pin Jack P.C.B. Ass'y (Component Side)
Flat Cable
MIC Jack P.C.B. Ass'y (Component Side)
Power Supply P.C.B. Ass'y (Component Side)
RAMM P.C.B. Ass'y (Component Side)
Logic P.C.B. Ass'y (Component Side)
Main P.C.B. Ass'y (Component Side)
Record Dolby NR P.C.B. Ass'y (Component Side)
Playback Amp. & Dolby NR P.C.B. Ass'y
Record Eq. Amp. P.C.B. Ass'y (Component Side)
FL Indicator P.C.B. A Ass'y (Component Side)
FL Indicator P.C.B. B Ass'y (Component Side)
Bar-graph
Detector P.C.B. Ass'y (Component Side)
Mechanism Control Switch P.C.B. Ass'y (Component Side)
Cam Control Volume
Counter Pulse Generator P.C.B. Ass'y (Component Side)
Capstan Motor
Cam Motor
Reel Motor
Azimuth Motor
Pitch Control Volume
Speed Ctl. P.C.B. Ass'y (Component Side)
Record Protector SW
Eject SW
Erase Head
Record Head
Playback Head
Chassis
Auto Shut-off P.C.B. Ass'y (Component Side)
Headphones
Display P.C.B. Ass'y (Component Side)
RAMM Control Switch P.C.B. Ass'y (Component Side)
Function Switch P.C.B. Ass'y (Component Side)
MIC Amp & Volume P.C.B. Ass'y (Component Side)

Fig. 12.2

13. SCHEMATIC DIAGRAMS

13.1. Amplifier Section



PIN JACK P.C.B.
MIC JACK P.C.B.
MIC AMP & VR P.C.B.
REC. DOLBY NR P.C.B.
MAIN P.C.B.
REC. Eq. AMP P.C.B.
DETECTOR P.C.B.
FL INDICATOR P.C.B. B
FL INDICATOR P.C.B. A
DISPLAY UNIT
PB AMP & DOLBY NR P.C.B.
Playback Head
CN-46
CN-22
CN-47
CN-44
CN-23
CN-53

IC Chart (REC DOLBY NR)	
Schematic Ref. No.	Description
IC101, 201	µA7300PC

IC Chart (MAIN)	
Schematic Ref. No.	Description
IC301	RC4558DD
IC302	RC4558D
IC303	µPD4066C
IC304, 305	RC4560D

IC Chart (REC. Eq.)	
Schematic Ref. No.	Description
IC301, 302, 303	RC4558DD
IC103, 203, 306, 307	µPD4508BC
IC101, 102, 201, 202, 304, 305	µPD4066C

IC Chart (PB AMP & DOLBY NR)	
Schematic Ref. No.	Description
IC301	RC4559DD
IC101, 201	µA7300PC

IC Chart (FL INDICATOR A, B , DETECTOR)									
Schematic Ref. No.	Description	Schematic Ref. No.	Description	Schematic Ref. No.	Description	Schematic Ref. No.	Discription	Schematic Ref. No.	Discription
IC301, 304, 306	RC4558D	IC603, 613	µPD4011C	IC607	RC4560D	IC901, 902, 903, 904	RC4558D	IC654, 655	TC4022BP
IC302, 303, 305	RC4560D	IC605	µPD4556C	IC608	µPD4025C	IC905			
IC601,	µPD4066C	IC606, 610, 651–653	µPD4001C	IC609	µPD4071C	IC906, 907, 908	µPD4011C		
IC602, 604, 611	µPD4081C	IC656, 657, 658, 659		IC612, 614	µPD40738C	IC615	µPD4040C		

Fig. 13.1

Notes:

1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

13.2. CPU Section

IC Chart (CPU A Section)

Schematic Ref. No.	Description
IC701	µPD546C113
IC702	µPD5101LC
IC703	µPD4508BC
IC704, 705	µPD4516BC
IC706, 707, 708, 709 710, 302	µPD4081C
IC711	µPD4071C
IC712	µPD4001C
IC713, 304	RC4560D
IC301	µPD4556C
IC306	RC4558D
IC303	µPD4011C

IC Chart (CPU B Section)

Schematic Ref. No.	Description
IC101, 201, 802	µPD4508BC
IC803, 808	µPD4011C
IC804	µPD4001C
IC805	RC4558D
IC806	µPD4040C
IC807	µPD4069C
IC809	µPD4081C
IC801	TC4514BP
IC301	µPD4556C

IC Chart (DISPLAY Section)

Schematic Ref. No.	Description
IC001	MSM5512
IC002	TC5022BP
IC003	M54516P

IC Chart (RAMM Section)

Schematic Ref. No.	Description
IC901	µPD546C114
IC902, 903	µPD4508BC
IC904, 905, 913	TC4013BP
IC906, 907, 908, 909 910, 916, 918	µPD4081C
IC911	RC4558D
IC912	TC4510BP
IC914	µPD4071C
IC915	TC4023BP
IC917	µPD4069C

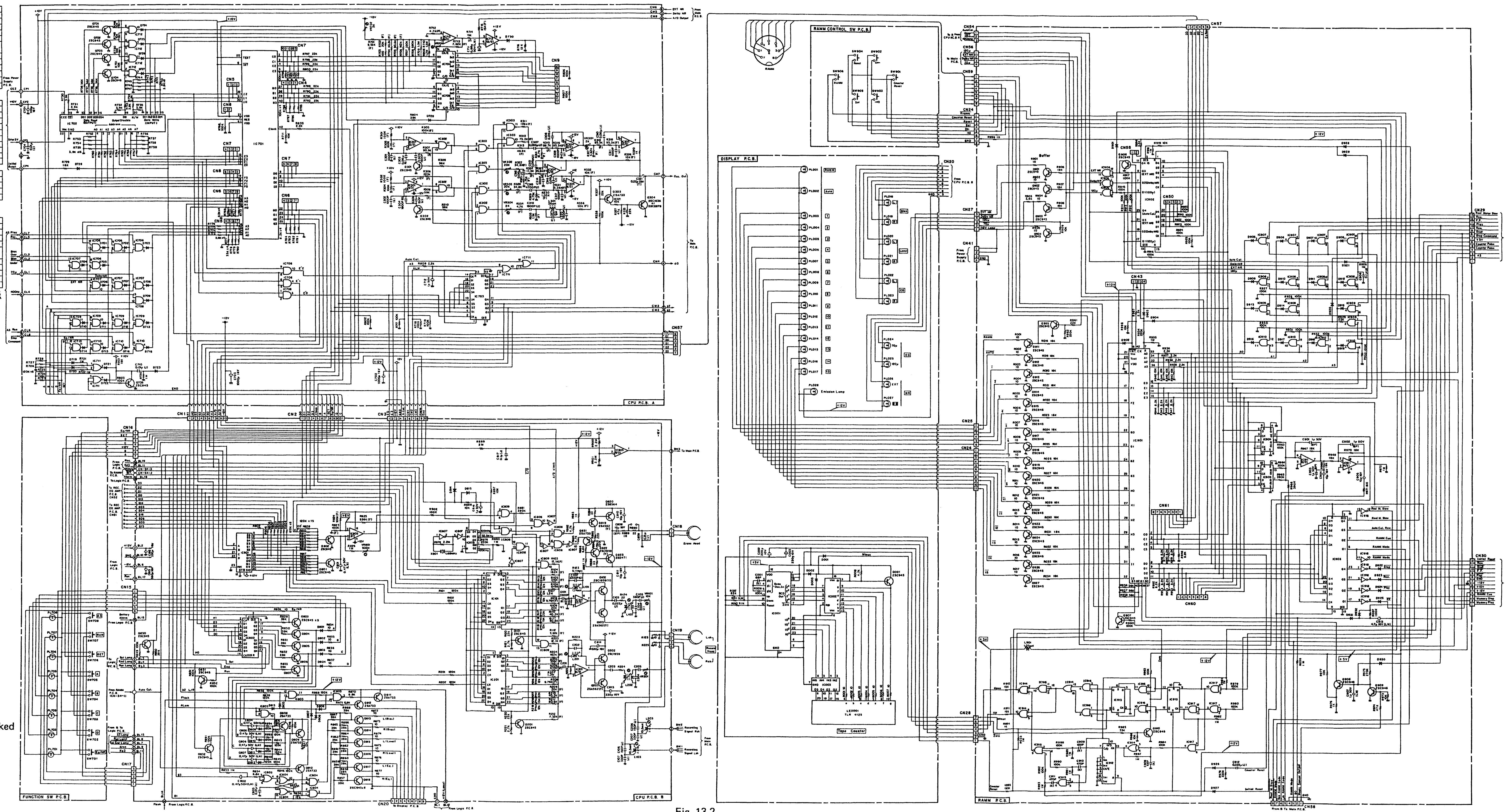
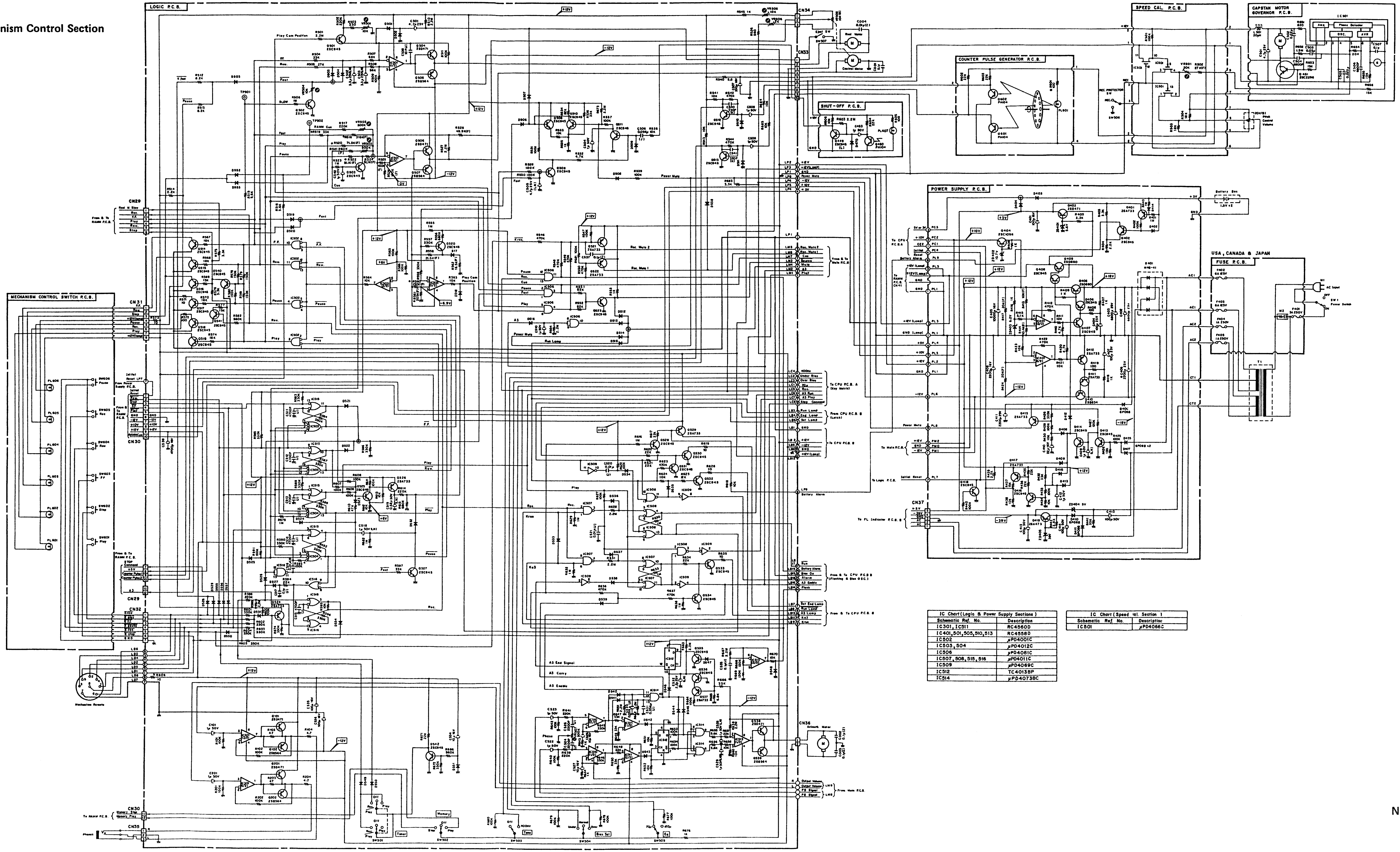
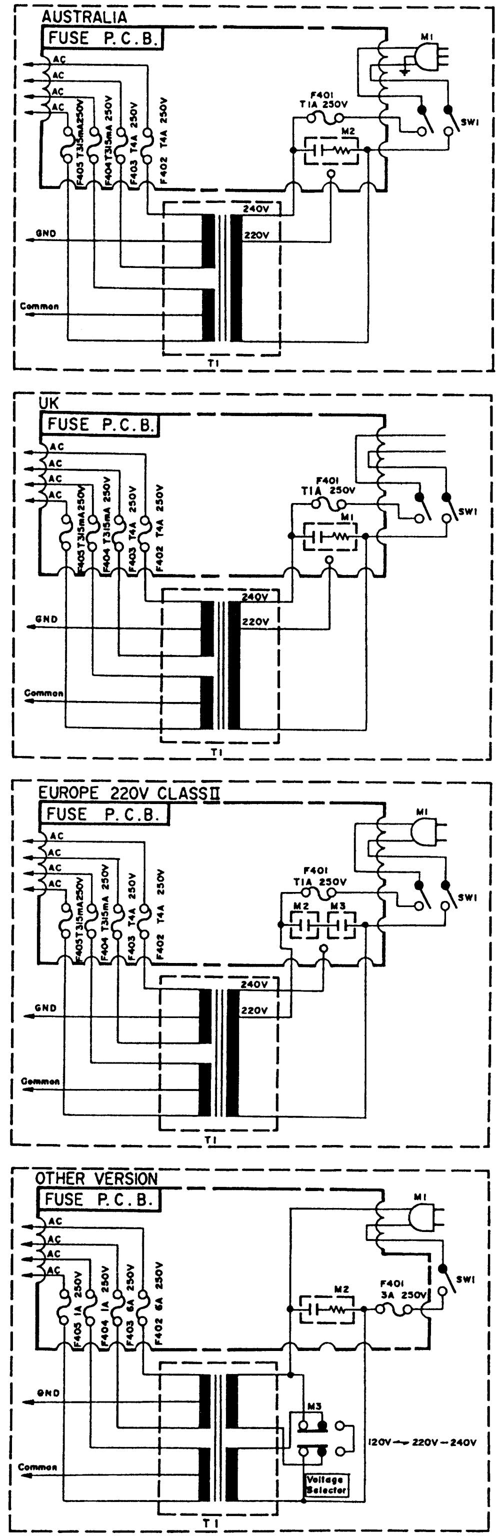

CPU P.C.B. A
CPU P.C.B. B
FUNCTION SW P.C.B.
DISPLAY P.C.B.
RAMM CONTROL SW P.C.B.
RAMM P.C.B.
Tape Counter
From Power Supply P.C.B.
From Logic P.C.B.
To Logic P.C.B.

Fig. 13.2

Notes:
1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

13.3. Mechanism Control Section


LOGIC P.C.B.
MECHANISM CONTROL SWITCH P.C.B.
SPEED CAL. P.C.B.
CAPSTAN MOTOR GOVERNOR P.C.B.
COUNTER PULSE GENERATOR P.C.B.
SHUT-OFF P.C.B.
POWER SUPPLY P.C.B.
USA, CANADA & JAPAN
FUSE P.C.B.
CN29
CN30
CN31
CN32
CN33
CN34
CN35
CN36
CN37


AUSTRALIA
FUSE P.C.B.
UK
FUSE P.C.B.
EUROPE 220V CLASS II
FUSE P.C.B.
OTHER VERSION
FUSE P.C.B.
Voltage Selector
120V ~ 220V ~ 240V

IC Chart (Logic & Power Supply Sections)	
Schematic Ref. No.	Description
IC301, IC511	RC4560D
IC401, 501, 505, 510, 513	RC4558D
IC502	μPD4001C
IC503, 504	μPD4012C
IC506	μPD4081C
IC507, 508, 515, 516	μPD4011C
IC509	μPD4069C
IC512	TC4013BP
IC514	μPD4073BC

IC Chart (Speed Cal. Section)	
Schematic Ref. No.	Description
IC501	μPD4066C

Fig. 13.3

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

13.4. IC Block Diagrams

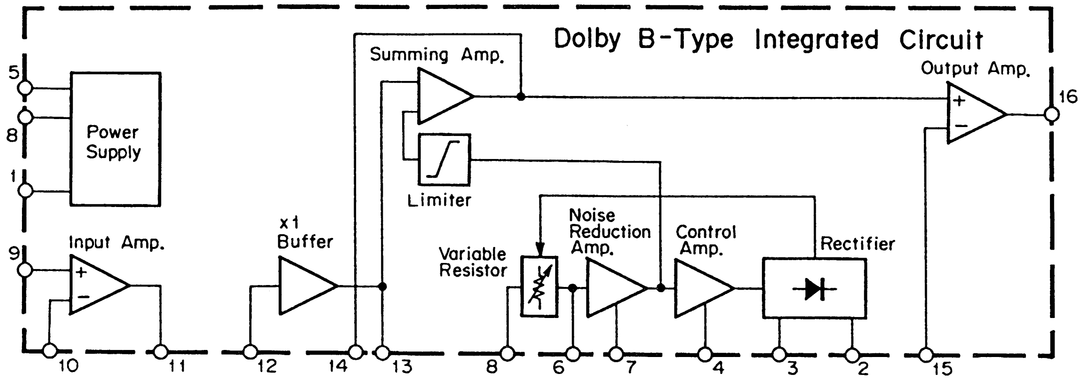

Dolby B-Type Integrated Circuit
Summing Amp.
Output Amp.
Power Supply
Limiter
Input Amp.
x1 Buffer
Variable Resistor
Noise Reduction Amp.
Control Amp.
Rectifier
5
8
1
9
16
10
11
12
14
13
8
6
7
4
3
2
15

Fig. 13.4 Dolby NR IC μA7300PC

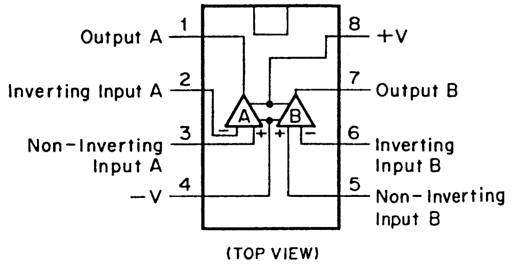

Output A 1
Inverting Input A 2
Non-Inverting Input A 3
−V 4
8 +V
7 Output B
6 Inverting Input B
5 Non-Inverting Input B
A
B
(TOP VIEW)

Fig. 13.5 OP Amp. IC 4558, 4559, 4560, 4556

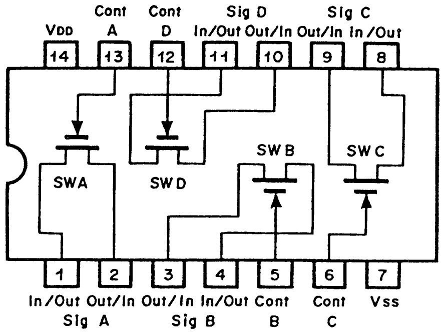

VDD 14
Cont A 13
Cont D 12
Sig D In/Out 11
Out/In 10
Sig C Out/In 9
In/Out 8
SWA
SWD
SWB
SWC
1 In/Out Sig A
2 Out/In
3 Out/In Sig B
4 In/Out
5 Cont B
6 Cont C
7 Vss

Fig. 13.6 Bilateral Switch C-MOS IC μPD4066C

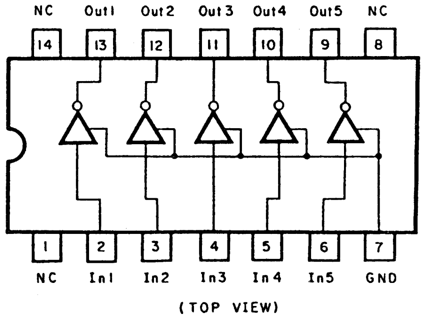

NC 14
Out1 13
Out2 12
Out3 11
Out4 10
Out5 9
NC 8
1 NC
2 In1
3 In2
4 In3
5 In4
6 In5
7 GND
(TOP VIEW)

Fig. 13.7 Transistor Array M54516P

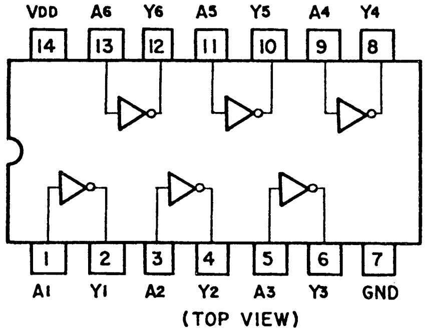

VDD 14
A6 13
Y6 12
A5 11
Y5 10
A4 9
Y4 8
1 A1
2 Y1
3 A2
4 Y2
5 A3
6 Y3
7 GND
(TOP VIEW)

Fig. 13.8 Inverter C-MOS IC μPD4049C

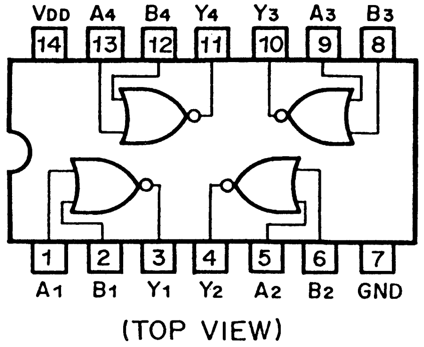

VDD 14
A4 13
B4 12
Y4 11
Y3 10
A3 9
B3 8
1 A1
2 B1
3 Y1
4 Y2
5 A2
6 B2
7 GND
(TOP VIEW)

Fig. 13.9 NOR Gate C-MOS IC μPD4001C

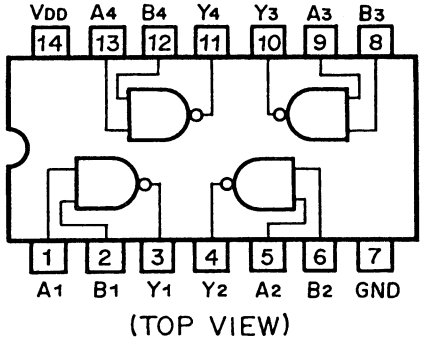

VDD 14
A4 13
B4 12
Y4 11
Y3 10
A3 9
B3 8
1 A1
2 B1
3 Y1
4 Y2
5 A2
6 B2
7 GND
(TOP VIEW)

Fig. 13.10 NAND Gate C-MOS IC μPD4011C

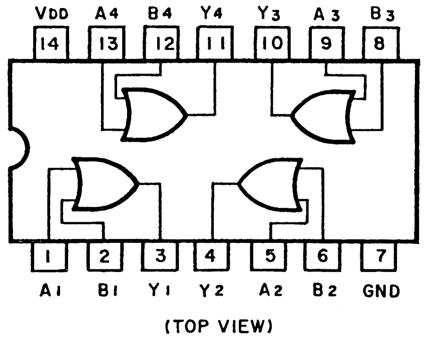

VDD 14
A4 13
B4 12
Y4 11
Y3 10
A3 9
B3 8
1 A1
2 B1
3 Y1
4 Y2
5 A2
6 B2
7 GND
(TOP VIEW)

Fig. 13.11 OR Gate C-MOS IC μPD4071C

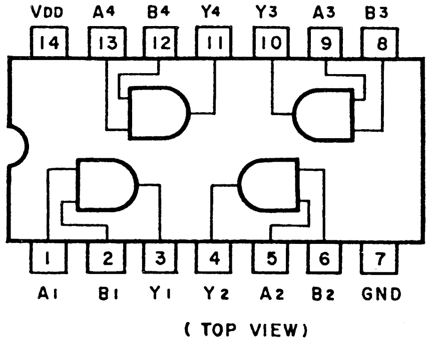

VDD 14
A4 13
B4 12
Y4 11
Y3 10
A3 9
B3 8
1 A1
2 B1
3 Y1
4 Y2
5 A2
6 B2
7 GND
(TOP VIEW)

Fig. 13.12 AND Gate C-MOS IC μPD4081C

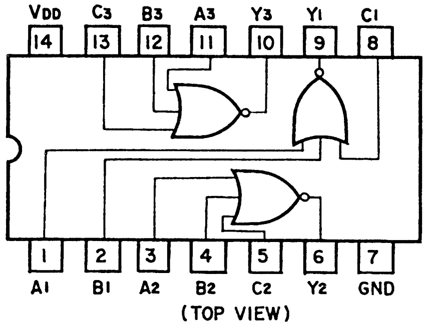

VDD 14
C3 13
B3 12
A3 11
Y3 10
Y1 9
C1 8
1 A1
2 B1
3 A2
4 B2
5 C2
6 Y2
7 GND
(TOP VIEW)

Fig. 13.13 NOR Gate C-MOS IC μPD4025C

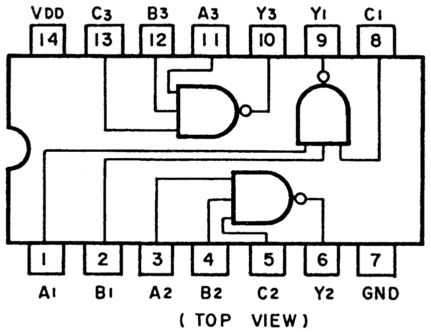

VDD 14
C3 13
B3 12
A3 11
Y3 10
Y1 9
C1 8
1 A1
2 B1
3 A2
4 B2
5 C2
6 Y2
7 GND
(TOP VIEW)

Fig. 13.14 NAND Gate C-MOS IC TC4023BP

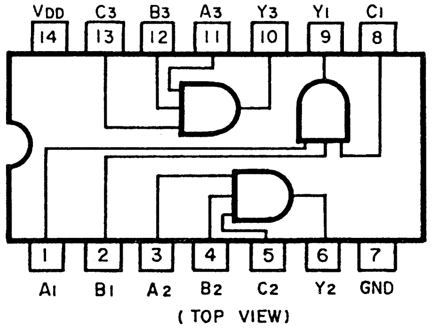

VDD 14
C3 13
B3 12
A3 11
Y3 10
Y1 9
C1 8
1 A1
2 B1
3 A2
4 B2
5 C2
6 Y2
7 GND
(TOP VIEW)

Fig. 13.15 AND Gate C-MOS IC μPD4073BC (TC4073BP)

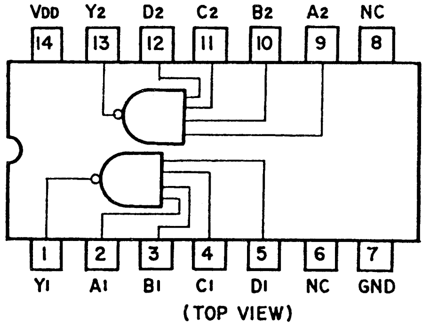

VDD 14
Y2 13
D2 12
C2 11
B2 10
A2 9
NC 8
1 Y1
2 A1
3 B1
4 C1
5 D1
6 NC
7 GND
(TOP VIEW)

Fig. 13.16 NAND Gate C-MOS IC μPD4012C

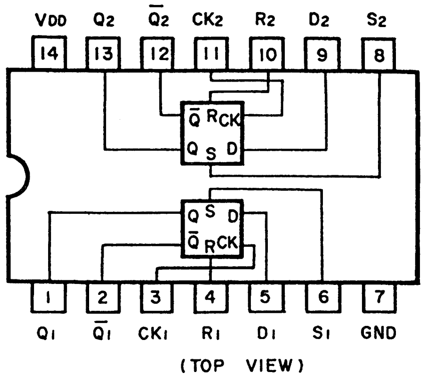

VDD Q2 $\overline{Q2}$ CK2 R2 D2 S2
14 13 12 11 10 9 8
1 2 3 4 5 6 7
Q1 $\overline{Q1}$ CK1 R1 D1 S1 GND
(TOP VIEW)

Fig. 13.17 D-Type Flip-Flop C-MOS IC TC4013BP

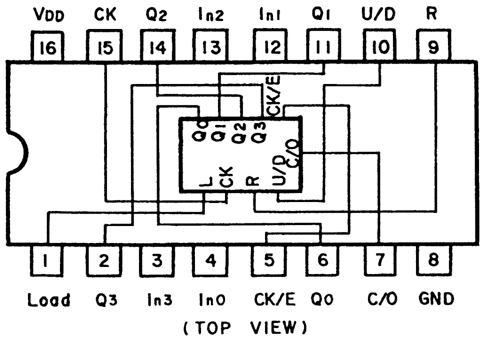

VDD CK Q2 In2 In1 Q1 U/D R
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
Load Q3 In3 In0 CK/E Q0 C/O GND
(TOP VIEW)

Fig. 13.18 BCD Up/Down Counter C-MOS IC TC4510BP

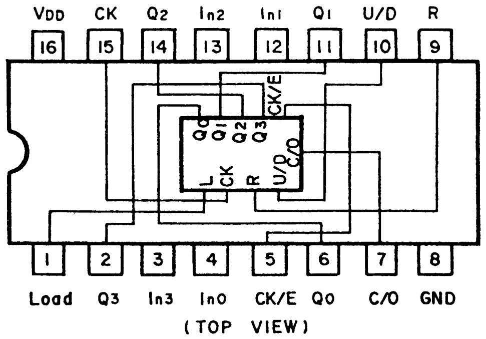

VDD CK Q2 In2 In1 Q1 U/D R
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
Load Q3 In3 In0 CK/E Q0 C/O GND
(TOP VIEW)

Fig. 13.19 Binary Up/Down Counter C-MOS IC TC4516BP

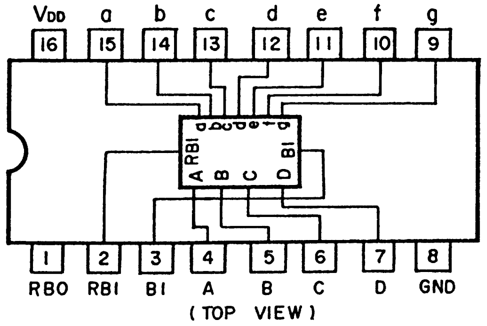

VDD a b c d e f g
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
RBO RBI BI A B C D GND
(TOP VIEW)

Fig. 13.20 BCD to 7-Segment Decoder/Driver C-MOS IC TC5022BP

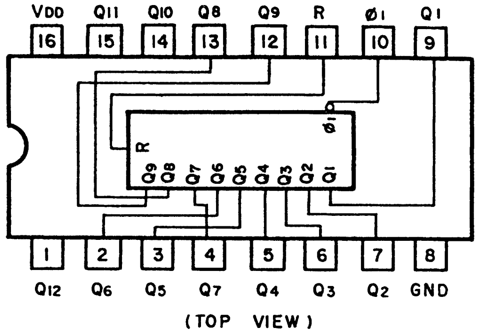

VDD Q11 Q10 Q8 Q9 R Ø1 Q1
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
Q12 Q6 Q5 Q7 Q4 Q3 Q2 GND
(TOP VIEW)

Fig. 13.21 12-Stage Binary Counter C-MOS IC TC4040BP

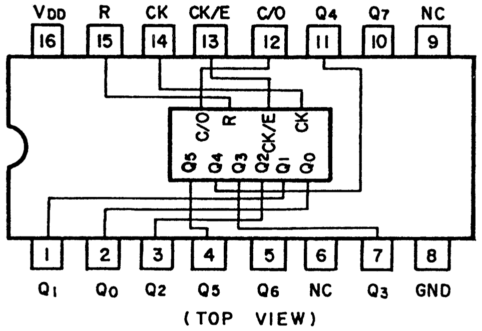

VDD R CK CK/E C/O Q4 Q7 NC
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
Q1 Q0 Q2 Q5 Q6 NC Q3 GND
(TOP VIEW)

Fig. 13.22 Octal Counter/Driver C-MOS IC TC4022BP

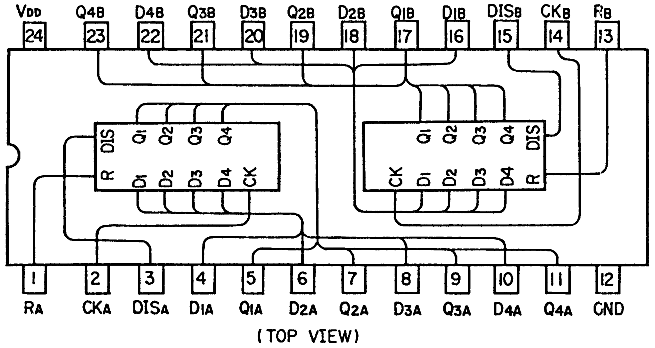

VDD Q4B D4B Q3B D3B Q2B D2B Q1B D1B DISB CKB RB
24 23 22 21 20 19 18 17 16 15 14 13
1 2 3 4 5 6 7 8 9 10 11 12
RA CKA DISA D1A Q1A D2A Q2A D3A Q3A D4A Q4A GND
(TOP VIEW)

Fig. 13.23 4-Bit Latch C-MOS IC TC4508BP (μPD4508BC)

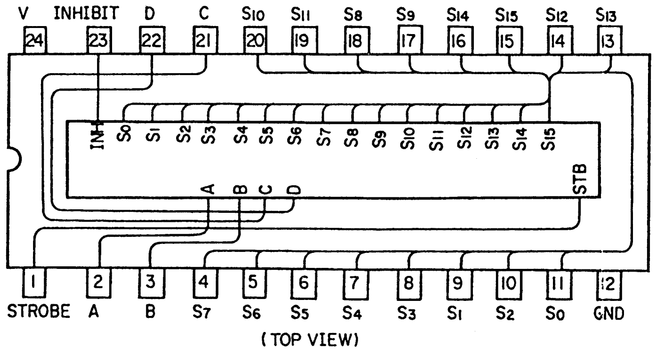

V INHIBIT D C S10 S11 S8 S9 S14 S15 S12 S13
24 23 22 21 20 19 18 17 16 15 14 13
1 2 3 4 5 6 7 8 9 10 11 12
STROBE A B S7 S6 S5 S4 S3 S1 S2 S0 GND
(TOP VIEW)

Fig. 13.24 4-to-16 Line Decoder C-MOS IC TC4514BP

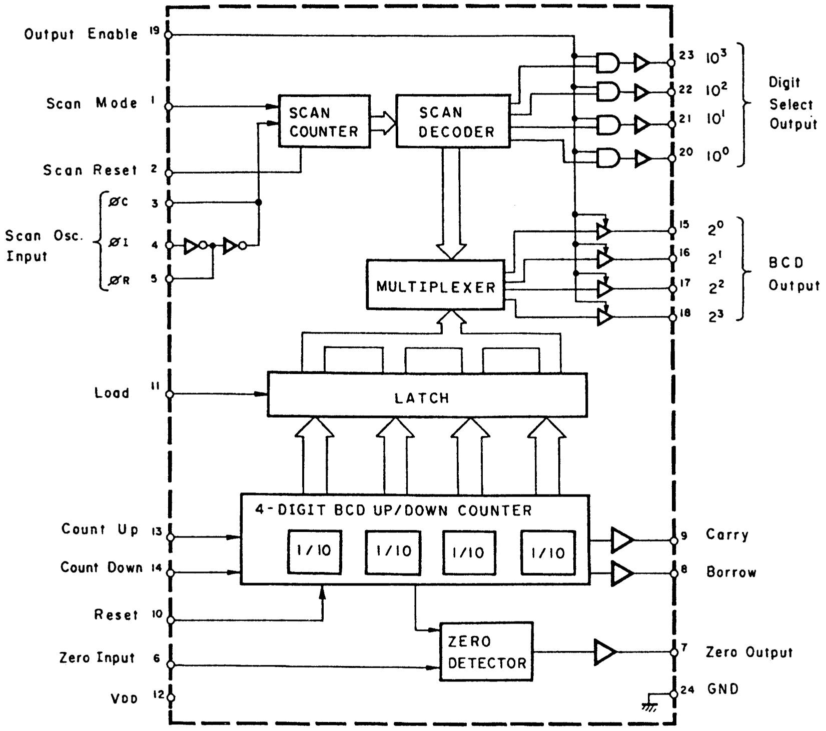
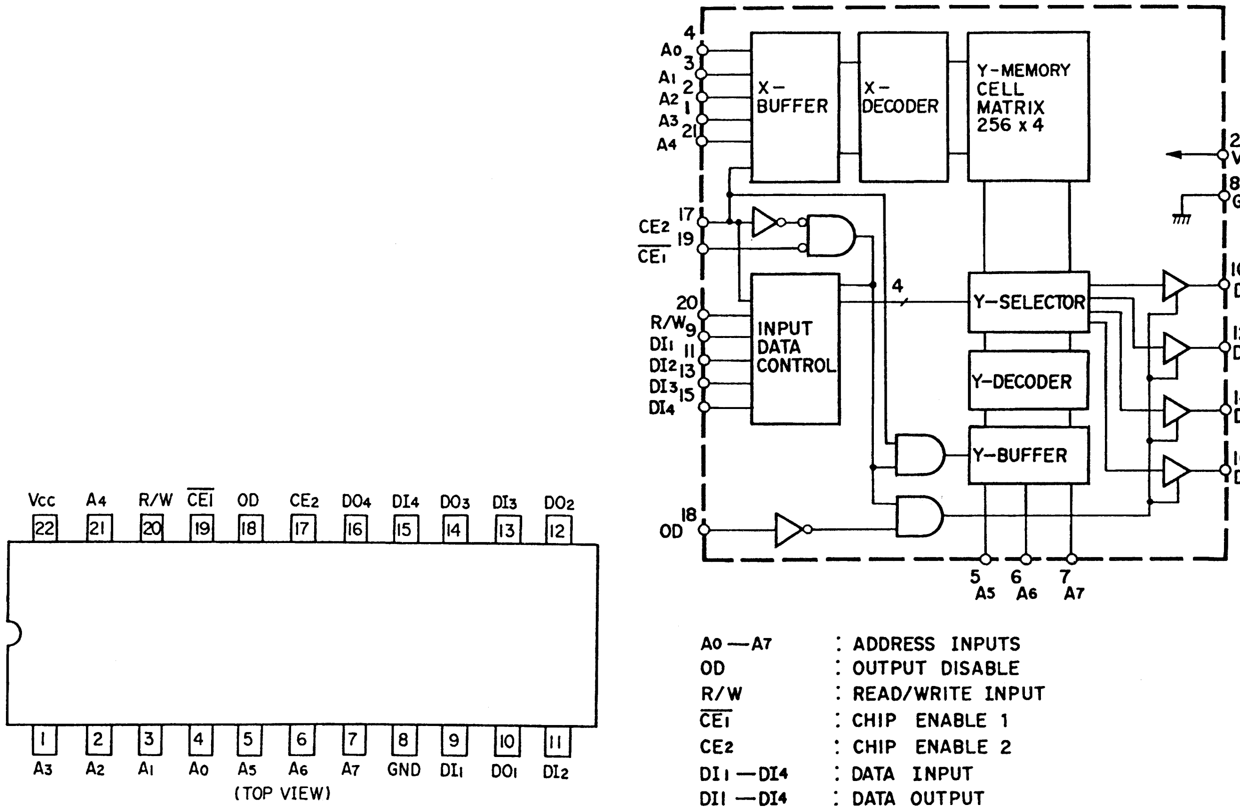
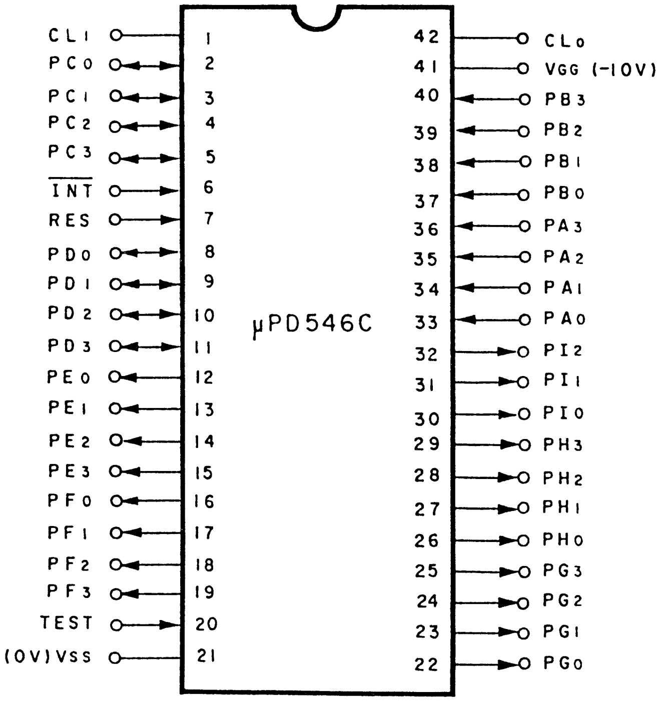

Output Enable 19
Scan Mode 1
Scan Reset 2
Scan Osc. Input
ØC 3
Ø1 4
ØR 5
SCAN COUNTER
SCAN DECODER
MULTIPLEXER
Load 11
LATCH
4-DIGIT BCD UP/DOWN COUNTER
1/10 1/10 1/10 1/10
Count Up 13
Count Down 14
Reset 10
Zero Input 6
VDD 12
ZERO DETECTOR
23 10³
22 10²
21 10¹
20 10⁰
Digit Select Output
15 2⁰
16 2¹
17 2²
18 2³
BCD Output
9 Carry
8 Borrow
7 Zero Output
24 GND

Fig. 13.25 4-Digit BCD Up/Down Counter C-MOS IC MSM5512RS


Vcc A4 R/W $\overline{CE1}$ OD CE2 DO4 DI4 DO3 DI3 DO2
22 21 20 19 18 17 16 15 14 13 12
1 2 3 4 5 6 7 8 9 10 11
A3 A2 A1 A0 A5 A6 A7 GND DI1 DO1 DI2
(TOP VIEW)
A0 4
A1 3
A2 2
A3 1
A4 21
X-BUFFER
X-DECODER
Y-MEMORY CELL MATRIX 256 x 4
22 Vcc
8 GND
CE2 17
$\overline{CE1}$ 19
20 R/W
9 DI1
11 DI2
13 DI3
15 DI4
INPUT DATA CONTROL
4
Y-SELECTOR
Y-DECODER
Y-BUFFER
10 DO1
12 DO2
14 DO3
16 DO4
OD 18
5 A5
6 A6
7 A7

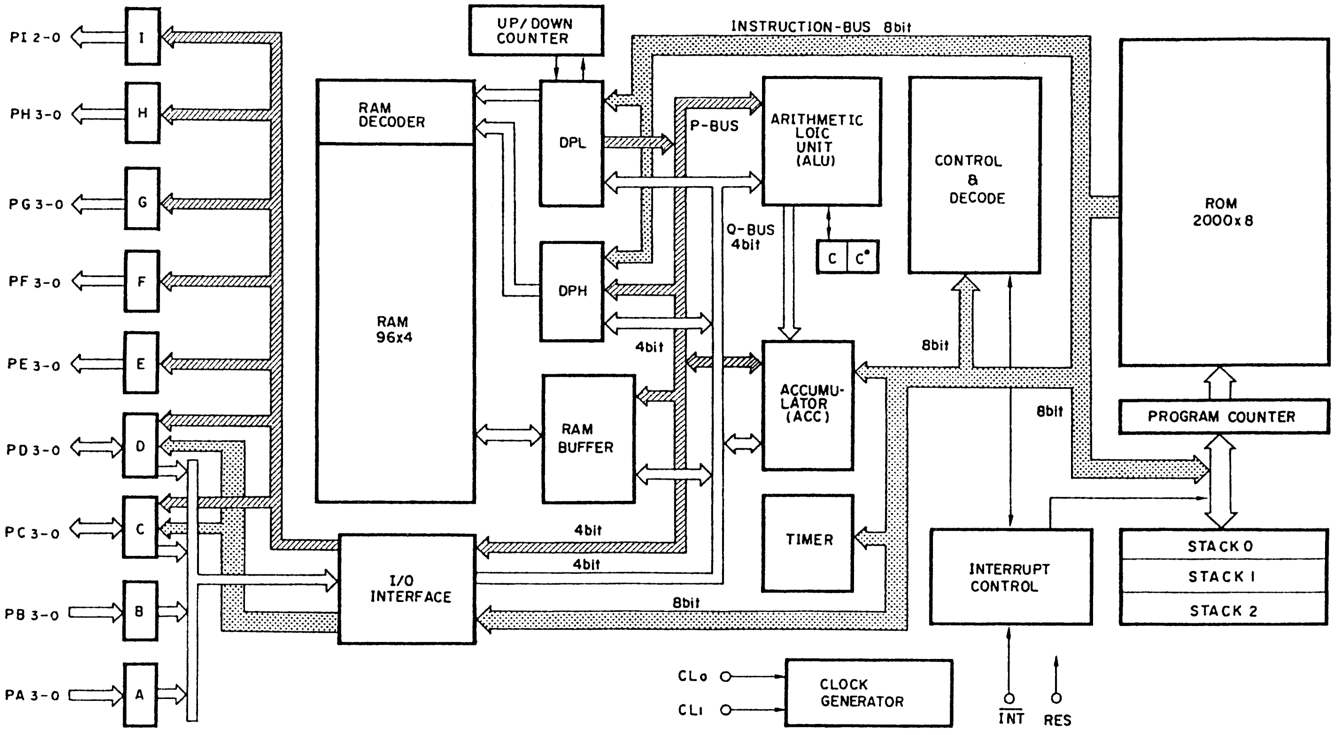
A0 — A7 : ADDRESS INPUTS
OD : OUTPUT DISABLE
R/W : READ/WRITE INPUT
$\overline{CE1}$: CHIP ENABLE 1
CE2 : CHIP ENABLE 2
DI1 — DI4 : DATA INPUT
DI1 — DI4 : DATA OUTPUT

Fig. 13.26 1024 (256 x 4) Bit Static RAM IC μPD5101LC


CLI
PC0
PC1
PC2
PC3
INT
RES
PD0
PD1
PD2
PD3
PE0
PE1
PE2
PE3
PF0
PF1
PF2
PF3
TEST
(0V) VSS
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
µPD546C
42
41
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
CLo
VGG (-10V)
PB3
PB2
PB1
PB0
PA3
PA2
PA1
PA0
PI2
PI1
PI0
PH3
PH2
PH1
PH0
PG3
PG2
PG1
PG0

(TOP VIEW)

CLo,1 : Crystal, inductor, or resistor input for internal oscillator
$\overline{\text{INT}}$: Interrupt
RES : Reset
PA3-0 : Input port A3-0
PB3-0 : Input port B3-0
PC3-0 : Bidirectional port C3-0
PD3-0 : Bidirectional port D3-0
PE3-0 : Output port E3-0
PF3-0 : Output port F3-0
PG3-0 : Output port G3-0
PH3-0 : Output port H3-0
PI2-0 : Output port I2-0
TEST : Test


PI 2-0
PH 3-0
PG 3-0
PF 3-0
PE 3-0
PD 3-0
PC 3-0
PB 3-0
PA 3-0
I
H
G
F
E
D
C
B
A
UP/DOWN COUNTER
INSTRUCTION-BUS 8bit
RAM DECODER
RAM 96x4
DPL
DPH
RAM BUFFER
P-BUS
Q-BUS 4bit
4bit
ARITHMETIC LOIC UNIT (ALU)
C
C*
ACCUMU-LATOR (ACC)
TIMER
CONTROL & DECODE
8bit
8bit
ROM 2000x8
PROGRAM COUNTER
STACK 0
STACK 1
STACK 2
INTERRUPT CONTROL
I/O INTERFACE
4bit
4bit
8bit
CLo
CLI
CLOCK GENERATOR
INT
RES

DP : DATA POINTER
C : CARRY Flip-Flop
C* : CARRY STRAGE Flip-Flop

Fig. 13.27 4-Bit Micro-processor µPD546C-113/114

14. REMOTE CONTROLLER RM-300

14.1. Schematic Diagram

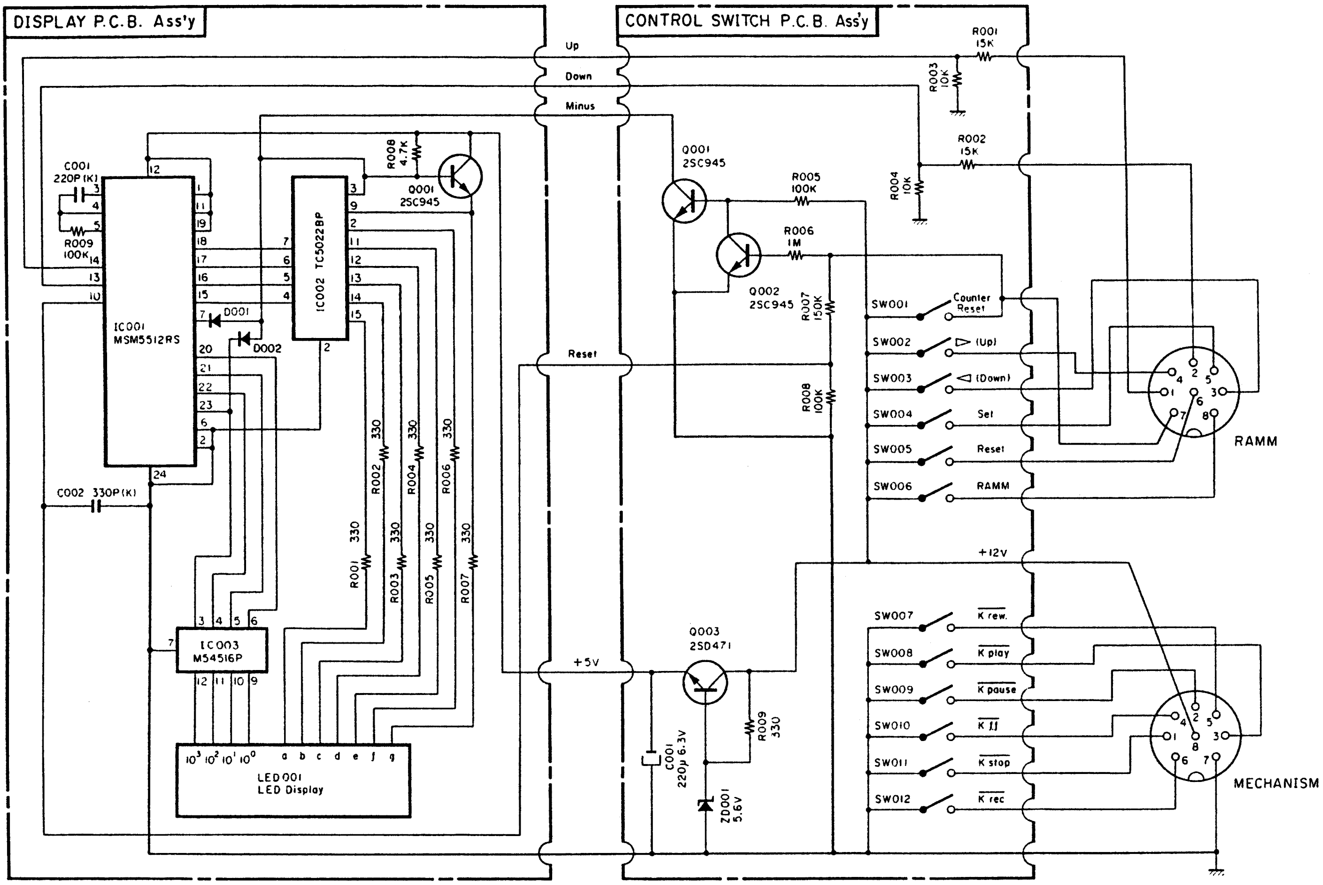

DISPLAY P.C.B. Ass'y
CONTROL SWITCH P.C.B. Ass'y
Up
Down
Minus
Reset
+5V
+12V
C001
220P (K)
R009
100K
IC001
MSM5512RS
IC002 TC5022BP
Q001
2SC945
R008
4.7K
D001
D002
C002 330P (K)
IC003
M54516P
R001 330
R002 330
R003 330
R004 330
R005 330
R006 330
R007 330
LED001
LED Display
10^3 10^2 10^1 10^0
a b c d e f g
R001
15K
R003
10K
R002
15K
R004
10K
Q001
2SC945
R005
100K
R006
1M
Q002
2SC945
R007
150K
R008
100K
SW001
Counter Reset
SW002
(Up)
SW003
(Down)
SW004
Set
SW005
Reset
SW006
RAMM
SW007
K rew.
SW008
K play
SW009
K pause
SW010
K II
SW011
K stop
SW012
K rec
Q003
2SD471
C001
220μ 6.3V
R009
330
ZD001
5.6V
RAMM
MECHANISM

Fig. 14.1

Note: Diode is 1SS53 unless otherwise specified.

14.2. Mounting Diagrams and Parts List

Note: Mounting diagram shows a dip side view of the printed circuit board.

(1) Control Switch P.C.B. Ass'y

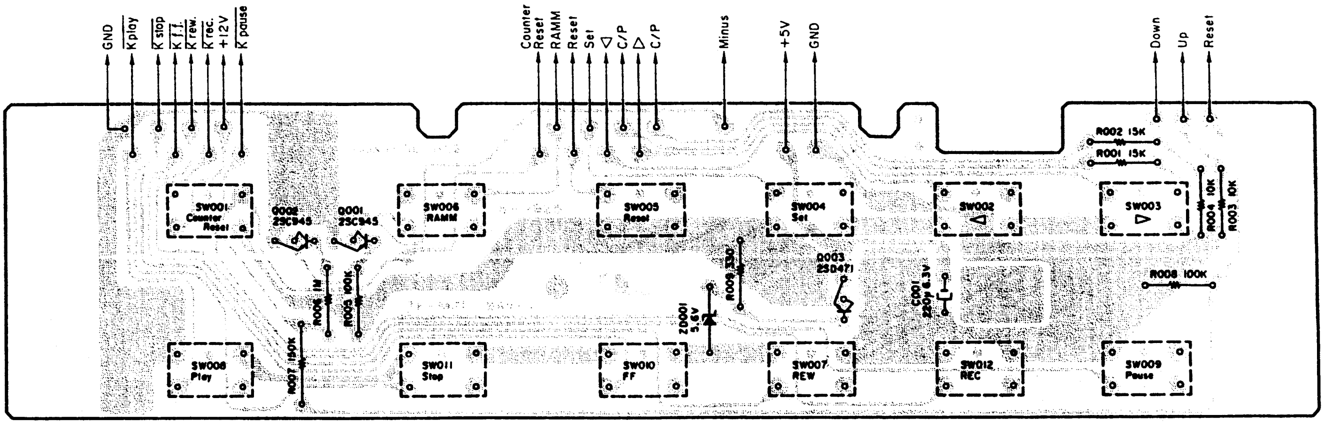

GND
Kplay
K stop
K f.f.
K rew.
K rec.
+12V
K pause
Counter Reset
RAMM Reset
Set
▽
C/P
△
C/P
Minus
+5V
GND
Down
Up
Reset
SW001 Counter Reset
Q002 2SC945
Q001 2SC945
SW006 RAMM
SW005 Reset
SW004 Set
SW002 ◁
SW003 ▷
R002 15K
R001 15K
R004 10K
R003 10K
R009 330
Q003 2SD471
C001 220μ 6.3V
R008 100K
R006 1M
R005 100K
R007 150K
ZD001 5.6V
SW008 Play
SW011 Stop
SW010 FF
SW007 REW
SW012 REC
SW009 Pause

Fig. 14.2

(2) Display P.C.B. Ass'y

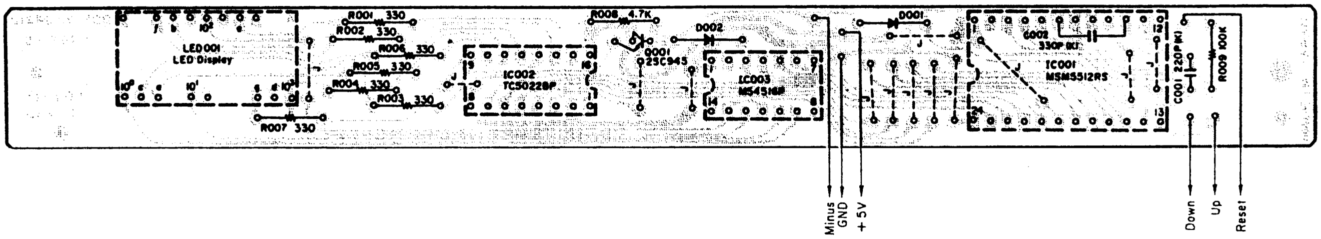

R001 330
R002 330
R006 330
R005 330
R004 330
R003 330
R007 330
LED001 LED Display
R008 4.7K
D002
Q001 2SC945
D001
IC002 TC5022BP
IC003 M45516P
C002 330P (K)
IC001 MSM5512RS
C001 220P(K)
R009 100K
Minus
GND
+5V
Down
Up
Reset

Fig. 14.3 Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04307A	**Control Switch P.C.B. Ass'y**		BA04306A	**Display P.C.B. Ass'y**
	0B07925A	Control Switch P.C.B.		0B07924A	Display P.C.B.
Q001,002	0B06100A	Transistor 2SC945 (A)	IC001	0B06259A	IC MSM5512RS
Q003	0B06066A	Transistor 2SD471	IC002	0B06211A	IC TC5022BP
ZD001	0B06290A	Zener Diode 5.6V RD5.6VEB2	IC003	0B06258A	IC M45516P
R001,002	0B01683A	Carbon Resistor 15K ERD-25T J	Q001	0B06100A	Transistor 2SC945 (A)
R003,004	0B01888A	Carbon Resistor 10K ERD-25T J	D001,002	0B06181A	Silicon Diode 1SS53
R005	0B01889A	Carbon Resistor 100K ERD-25T J	R001-007	0B05577A	Carbon Resistor 330 ERD-25T J (7 pcs.)
R006	0B05776A	Carbon Resistor 1M ERD-25T J			
R007,008	0B05626A	Carbon Resistor 150K ERD-25T J	R008	0B01846A	Carbon Resistor 4.7K ERD-25T J
R009	0B05577A	Carbon Resistor 330 ERD-25T J	R009	0B01889A	Carbon Resistor 100K ERD-25T J
C001	0B09151A	Electrolytic Capacitor 220μ 6.3V	C001	0B09283A	Ceramic Capacitor 220P 50V K
SW001-012	0B07354A	Push Switch KHG10901 (12 pcs.)	C002	0B09285A	Ceramic Capacitor 330P 50V K
			LED001	0B06289A	LED Display Unit
				0J04237A	Counter Himelon (1 pce.)

14.3. Mechanism Ass'y and Parts List

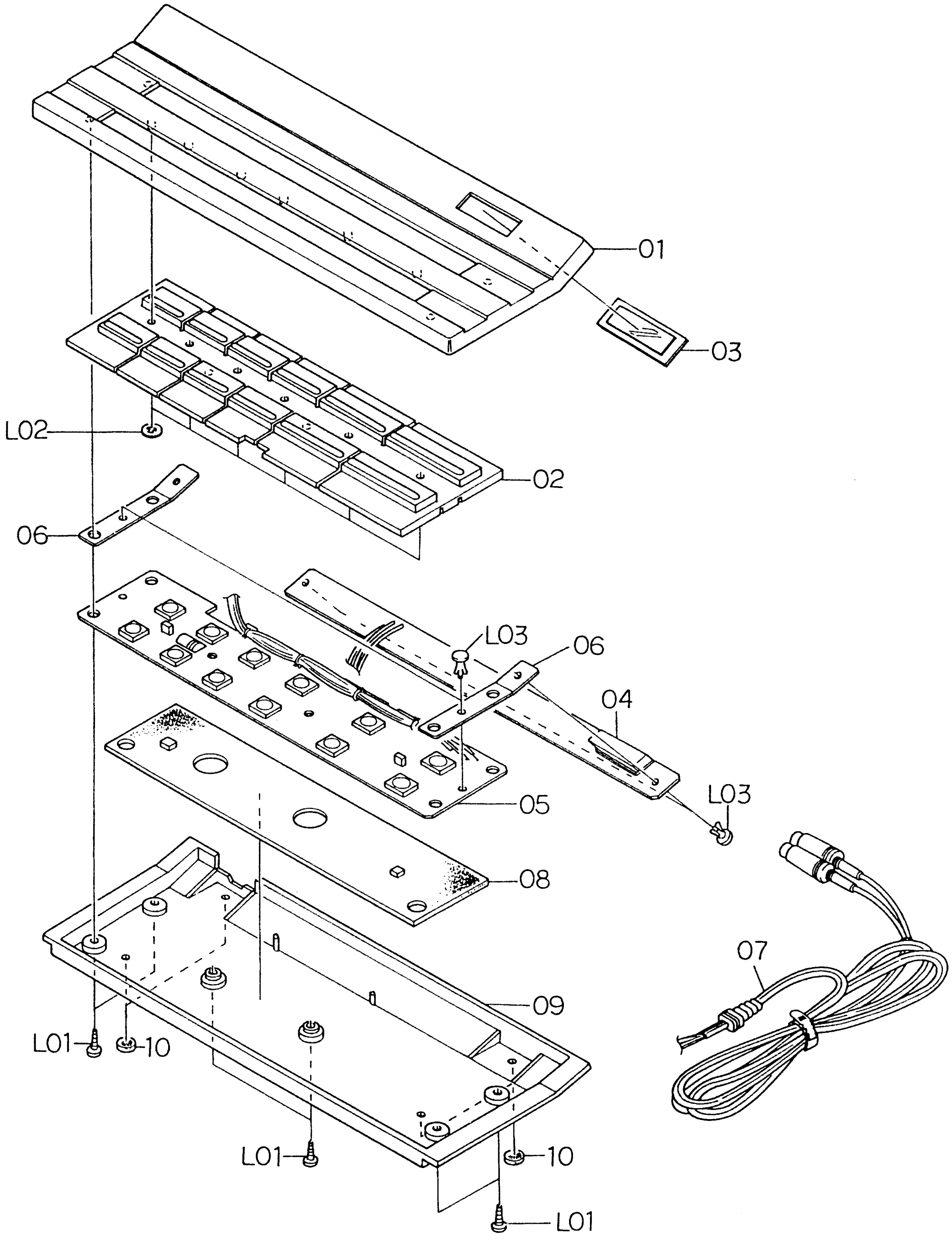


Fig. 14.4

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
		RM-300 Mechanism Ass'y			0B08831A	Cord Stopper	(1)
					0B08865A	8P DIN Plug (RAMM)	(1)
01	0H03917A	Top Case	1		0B08866A	8P DIN Plug (Mechanism)	(1)
02	0H03918A	Switch Knob	1	08	0J04287A	Bottom Case Rubber	1
03	0H03922A	Counter Lens	1	09	0H03918A	Bottom Case	1
04	BA04306A	Display P.C.B. Ass'y	1	10	0H03920A	Leg	4
05	BA04307A	Control Switch P.C.B. Ass'y	1	L01	0E00938A	BT Screw M3x8 Philips Binding Head (Black Chromate)	6
06	0J04266A	P.C.B. Holder	2				
07	BA04309A	Remote Cord Ass'y	1	L02	0E00252A	Stopper Ring CS 3mm	6
	0B08827A	Cord Bushing	(1)	L03	0B08539A	Plastic Rivet	4
	0B08828A	8Px2 Cord	(1)				

15. SPECIFICATIONS

Power Source	100, 120, 120/220-240, 220 or 240 V AC ; 50/60 Hz (According to country of sale)
Power Consumption	65 W max.
Tape Speed	1-7/8 ips (4.75 cm/sec.)
Wow and Flutter	Less than 0.04% Wrms Less than 0.08% Wpeak
Frequency Response (w. auto calibration)	20–20,000 Hz ±0.75 dB (18–25,000 Hz ±3 dB) Nakamichi EX, EXII, SX, ZX tape Recording level –20 dB
Signal to Noise Ratio	Better than 66 dB (3% THD) Better than 60 dB (0 dB) (IHF-A, Wrms, 400 Hz, w. Dolby NR, ZX tape, 70 µsec)
Total Harmonic Distortion	Less than 0.8% (ZX tape) Less than 1.0% (SX, EXII tape) (400 Hz, 0 dB)
Erasure	Better than 60 dB (100 Hz)
Separation	Better than 37 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Bias Frequency	105 kHz
Input (Line)	50 mV 50 k ohms
(Microphone)	0.2 mV, 10 k ohms
(Noise Reduction)	100 mV, 50 k ohms
Output (Line)	1 V (400 Hz, 0 dB, output control at max.)
(Headphone)	45 mW (400 Hz, 0 dB, output control at max.)
(Noise Reduction)	100 mV, 2.2 k ohms
Dimensions	527 (W) x 258 (H) x 322 (D) millimeters 20-3/4 (W) x 10-5/32 (H) x 12-43/64 (D) inches
Approximate Weight	19 kg 41 lb. 14 oz

- Specifications and appearance design are subject to change for further improvement without notice.
- Dolby NR under license from Dolby Laboratories.
- The word "DOLBY" and the Double-D-Symbol are trademarks of Dolby Laboratories.